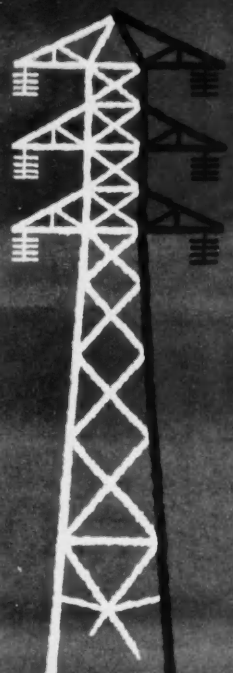
27 MAY 1954 NINEPENCE

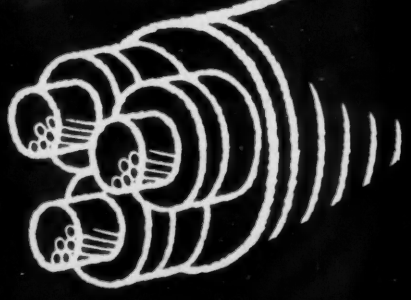
ELECTRICAL TIMES

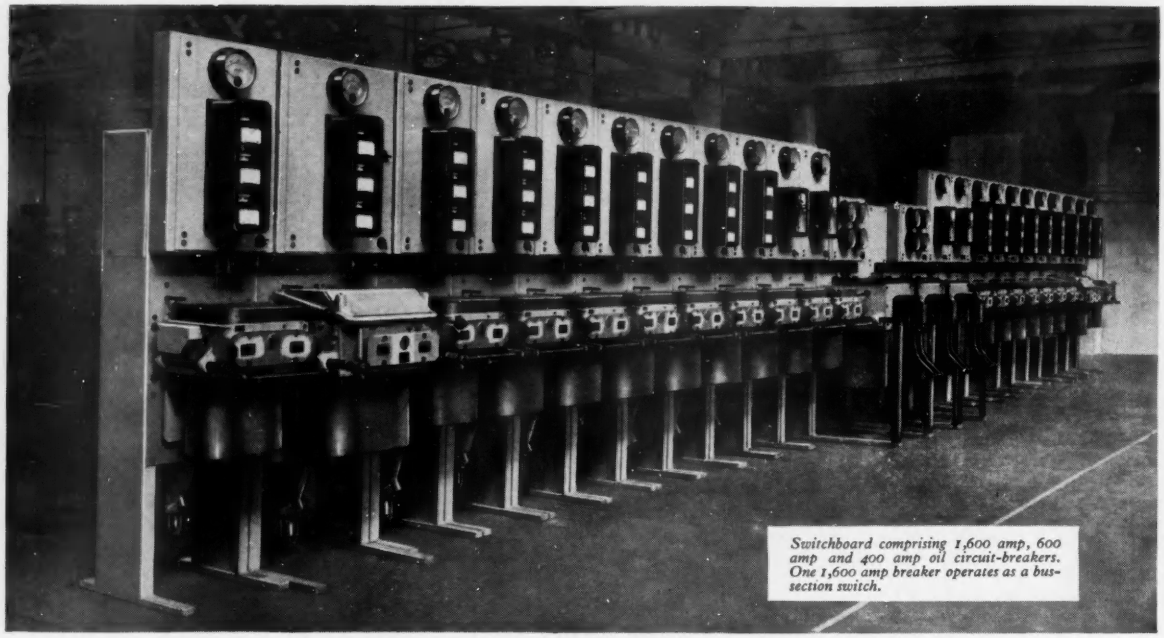
BICC

TRANSMISSION

FOR ALL
VOLTAGES
UP TO 275,000





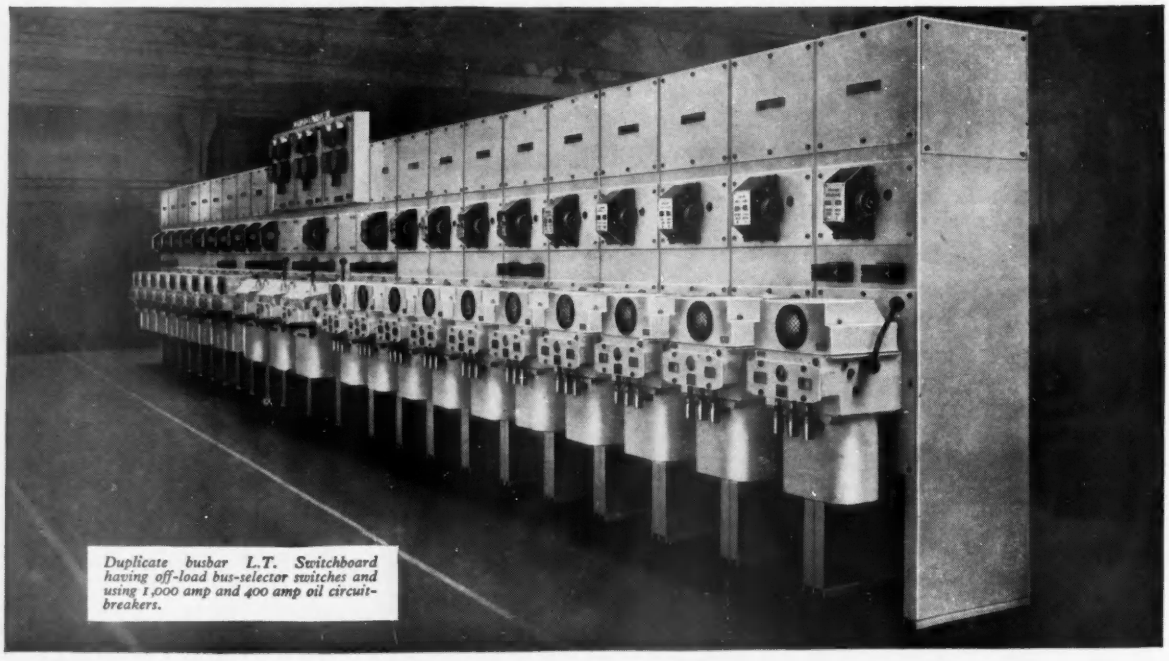


Switchboard comprising 1,600 amp, 600 amp and 400 amp oil circuit-breakers. One 1,600 amp breaker operates as a bus-section switch.

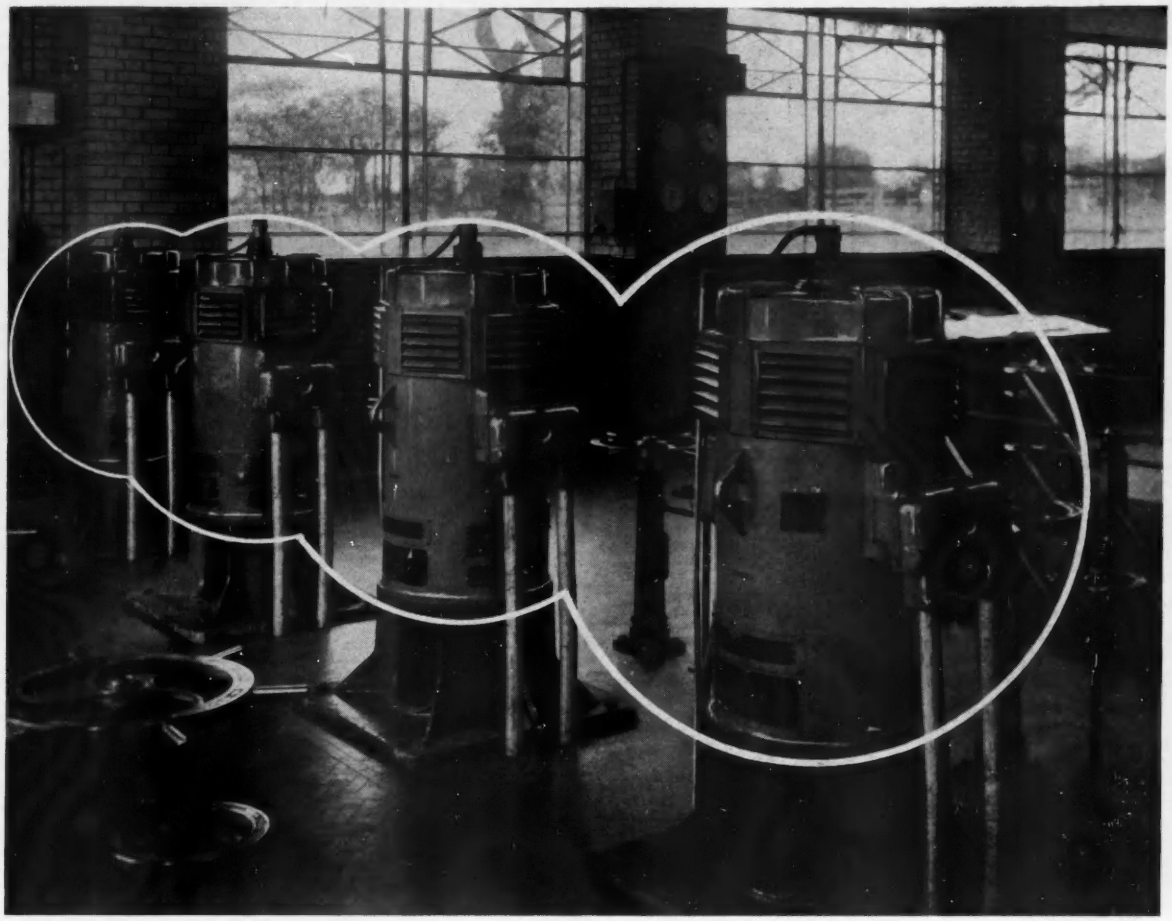
J. & P. LOW VOLTAGE SWITCHGEAR

These two switchboards supplied to the Iraq Petroleum Company are typical of J. & P. low voltage oil-break switchgear. Designed and A.S.T.A. certified for ratings up to 2,000 amp, 30 MVA, this gear can be supplied with horizontal isolation if required. Power closing mechanisms are available for the higher current ratings and rupturing capacities.

JOHNSON & PHILLIPS LTD., CHARLTON, LONDON, S.E.7



Duplicate busbar L.T. Switchboard having off-load bus-selector switches and using 1,000 amp and 400 amp oil circuit-breakers.



N-S variable speed a.c. motors, 45/12 h.p., 1100/700 r.p.m., driving raw water pumps at Seedy Mill Pumping Station (South Staffordshire Water Works Co.). The four booster pump motors at this station are each driven by 700 h.p. N-S motors.

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Fans for confined spaces

Woods *Aerofoil* fans require less space than centrifugals, they simplify ducting, require no bulky bends. S-type fans with short casings as illustrated are ultra-compact and economical in cost. Write for publication V2006. Woods fan engineer in your area will be happy to call.

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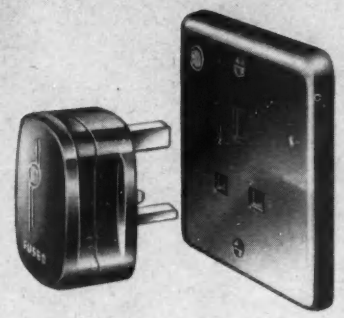
WOODS OF COLCHESTER LIMITED, BRAISWICK WORKS, COLCHESTER

An associate company of The General Electric Company Ltd.

You cannot buy better gear



13 AMP ACCESSORIES TO B.S. 1363

★ SOCKET OUTLET
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AVAILABLE FOR SURFACE OR FLUSH MOUNTING
BROWN, CREAM OR IVORY
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GLASGOW. J. D. HARRIS. 57 VINCENT LANE

Another home for some lucky family . . . with all mod. con. of course — most of them electric. Depending on good cables—rubber or thermoplastic—developed by members of the Cable Makers Association.

By close technical collaboration among its members, the Cable Makers Association has pioneered the most important developments in electric cable making. That same collaboration makes possible the exceptionally high standards for all types of C.M.A. cable—and safeguards every user.

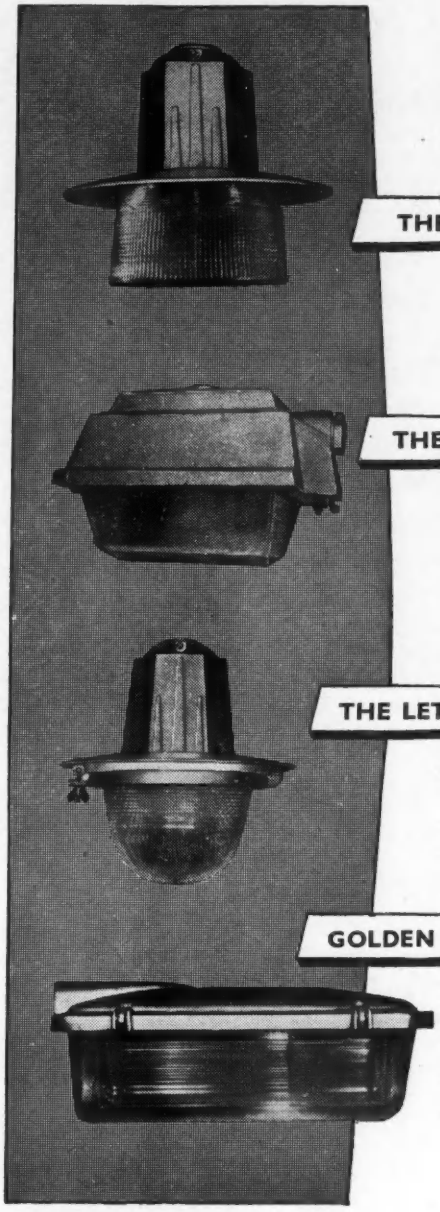
SPECIFY C·M·A CABLES

VISIT STAND 96 B.E.P.C.

CABLE MAKERS ASSOCIATION, 52/54, HIGH HOLBORN, LONDON, W.C.I.

Improve Your street lighting

These fittings make all the difference!



These four fittings from the ELECO range of street lighting lanterns embody all the latest improvements as recommended in B.S. Specification 1788 for lantern construction.

THE WELWYN lantern has been re-styled and the refractor springs are totally enclosed to give complete protection against all weather conditions, also giving the interior of the fitting a clean appearance.

THE LANCASTER lantern is a controlled cut-off fitting which reduces glare to a minimum. The distribution from the horizontal Mercury discharge lamp in the upper half of the fitting is reflected by means of specially designed reflectors through the scientifically designed refractor bowl giving high and even illumination on the road surface.

THE LETCHWORTH lantern incorporates a 12″ diameter reflector and two pairs of focal positioning stops. The bowl type refractor is designed for use with gas-filled lamps from 100W to 200W and combines maximum light control, with the highest possible efficiency. The joint between the refractor, refractor ring and body casting is rendered dust-proof by the use of thick white felt gaskets.

GOLDEN RAY MK. III lantern is completely dustproof and is available for all sizes of sodium discharge lamps. The "Perspex" refractor plates have machined "Perspex" prisms sealed by a special process to the interior of the outer enclosing "Perspex" bowl and because of the unique dustproof qualities of this fitting, maintenance costs are reduced to a minimum.

ELECO

Engineering & Lighting Equipment Co. Ltd

SPHERE WORKS, ST. ALBANS, HERTS.

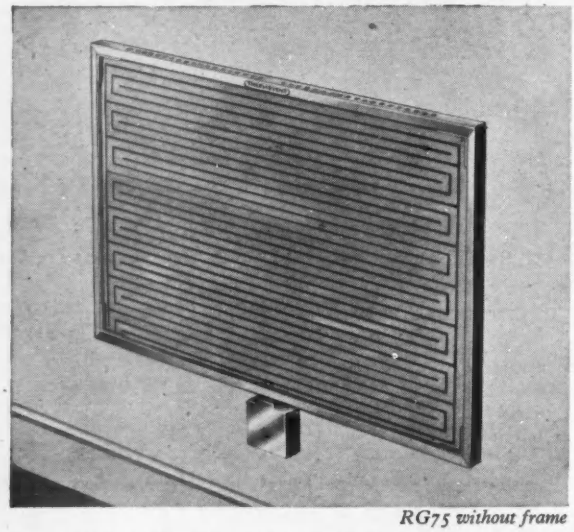
Telegrams: VOLTARCON, ST. ALBANS. *Telephone:* ST. ALBANS 2258/2259

'RADIANT GLASS' THERMOPANELS

. . . . bring 100% efficient, non-luminous, infra-red radiant warmth to any location where rapid local heating is required. No glowing wires or exposed fittings. The element is fused directly on to armour-plate glass, tempered for strength, shock resistance and durability.

Available in 750 and 1,000-watt loadings in two types: type RG for industrial applications and type RGF with wall frame for use where appearance is important, both intended for wall mounting about 9-12″ from floor level.

An intriguing innovation in space heating



RG75 without frame

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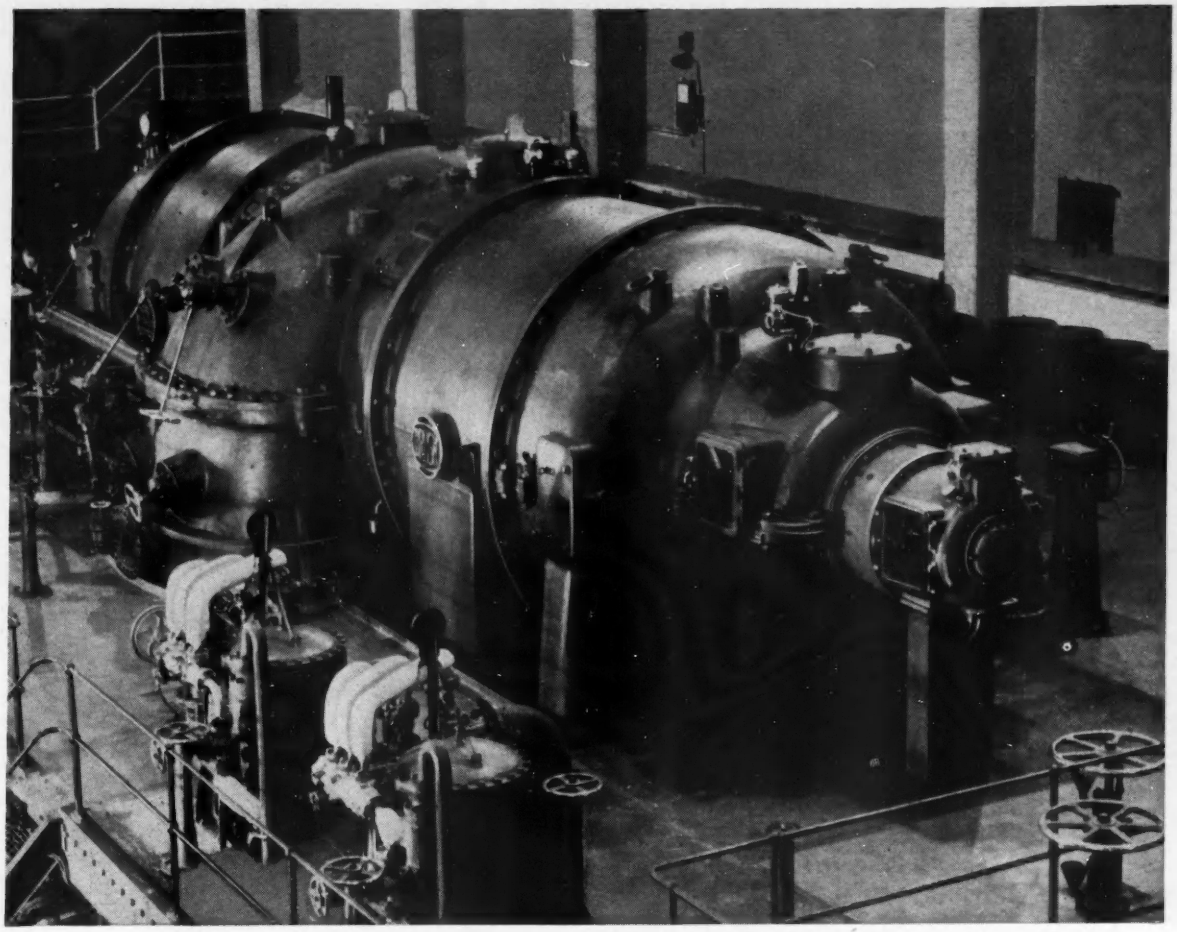

A Brush-Ljungström 30,000 kW Turbo-Generator Set installed at the Wolverhampton Station of the British Electricity Authority.

DESIGNED—to meet all demands

THE BRUSH-LJUNGSTRÖM TURBINE is designed to meet all requirements of modern power station practice.

It is of the double rotation type with the result that it is compact; an important consideration when contemplating the problem of raising the capacity of plant in an existing power station. The turbine, which is comparatively light, is supported mainly by the condenser which is carried on four concrete blocks.

Foundations of the usually accepted concrete and steel work structures are not required. Considerable saving in capital outlay on buildings can thus be effected.

Consulting and generation engineers desiring further information should write for Publication No. 61000c.

Turbo-Alternators by BRUSH

We are Exhibiting on the BRUSH GROUP STAND No. J5, at the MECHANICAL HANDLING EXHIBITION, OLYMPIA, June 9th-19th.

BRUSH ELECTRICAL ENGINEERING CO. LTD., LOUGHBOROUGH, ENGLAND

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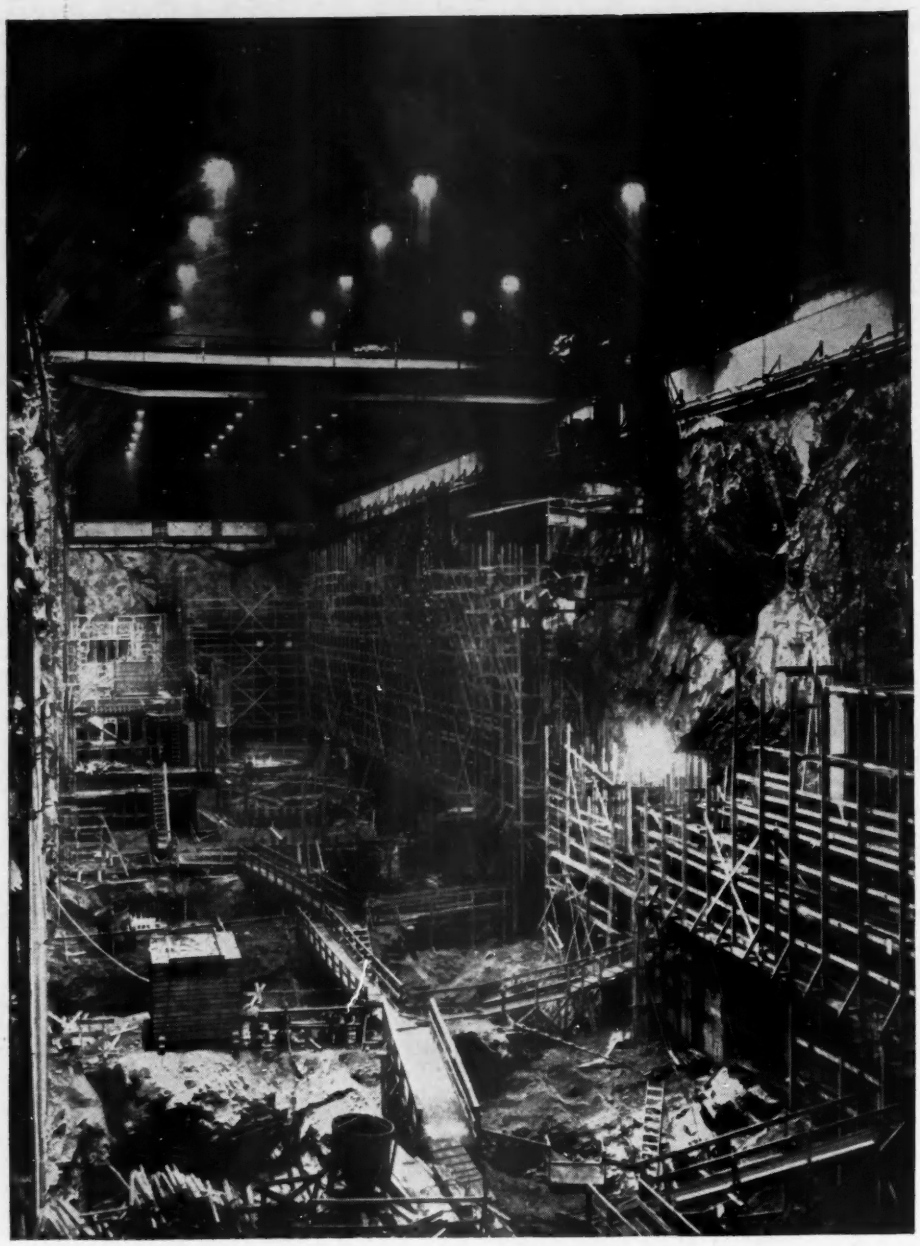
aluminium adventure



powerhouse inside a MOUNTAIN

Excavated inside the heart of Mount Du Bose, British Columbia, this huge man-made cavern will eventually house 16 hydro-electric turbines and generators, with a total capacity of over 2,000,000 horse power.

Already, on the other side of the mountain range, the water level is gradually rising in a 350 square-mile storage reservoir of rivers and lakes, formed by reversing an entire river system. The water will flow into a 10-mile tunnel drilled through the mountain and plunge 2,585 vertical feet—16 times the height of Niagara—to drive the turbines of the Kemano underground power house.

From Kemano, a 50 mile transmission line will carry the power across rocky terrain and over a 5,300 ft. mountain pass to the great new smelter of Aluminum Company of Canada Ltd., at Kitimat—capable when fully developed of producing 500,000 metric tons of Aluminium a year for the markets of the world.

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Incorporated in Canada

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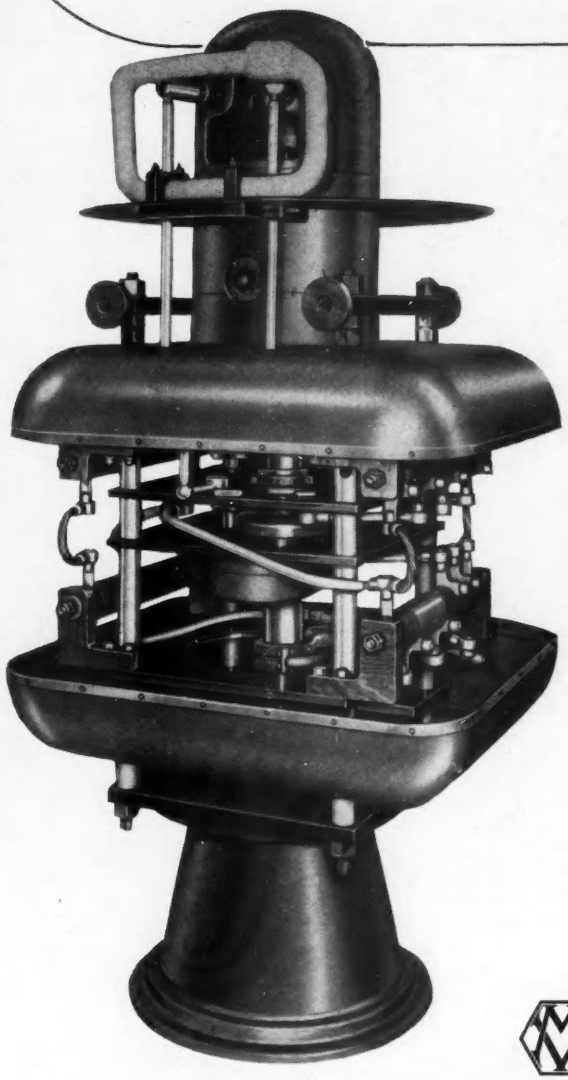
Technical progress in

TRANSFORMERS

pioneered by Metrovick



ON-LOAD TAP CHANGING EQUIPMENT FOR 275 kV

The design of Metrovick on-load tap changing gear for the British Electricity Authority 275 kV system follows the principles already proved in practical service. In 1949 the company installed in Holland the highest voltage class "fully insulated" tap changer that had at that time been built. From the original Metrovick work on this and other high voltage systems, the current design for 132/275-kV systems has developed. In tap changers, as in other aspects of transformer design and construction, Metrovick are pioneering advances which set new standards for the industry.

Close-up view with cover removed of selector switch on Metrovick on-load tap changer developed for 220/150 kV three-phase transformer group built for the Netherlands.

METROPOLITAN-VICKERS

ELECTRICAL CO LTD · TRAFFORD PARK · MANCHESTER, 17

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BRITISH-MADE THERMO-COUPLE WIRES

When there is a choice between a British-made product and a foreign equivalent, there are obvious advantages in buying the home-produced article.

In the matter of base metal thermo-couple wires there is one very sound reason for using the British-made 'T1/T2', in that every operation in the manufacture of these wires, from the initial melt to the final product, is carried out at the same plant. Only in that way can there be, at every stage, a precise control of quality.

'T1' (nickel chromium) and 'T2' (nickel aluminium) have been developed to operate at temperatures up to 1,100° C.

For lower temperatures 'Special Advance' alloy is supplied for use with copper up to 500° C. and with iron up to 900° C. to users' individual requirements.

'T1/T2' and 'Special Advance'

BRITISH DRIVER-HARRIS CO. LTD

MANCHESTER 15

Nickel and Nickel Alloy Specialists :—for furnace elements, domestic appliances, thermo-couples, telecommunications, lamps, spark plugs, fine wires, etc.

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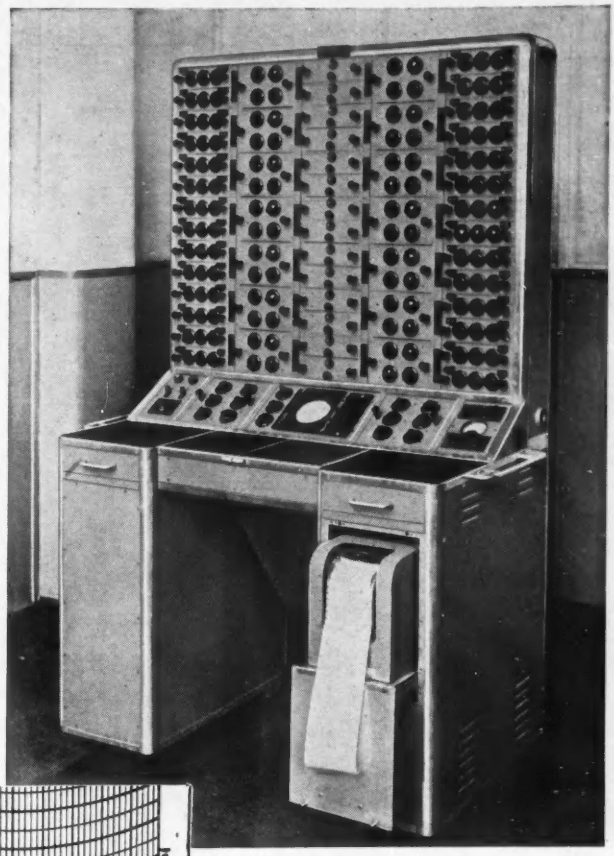
High-speed RECORDING

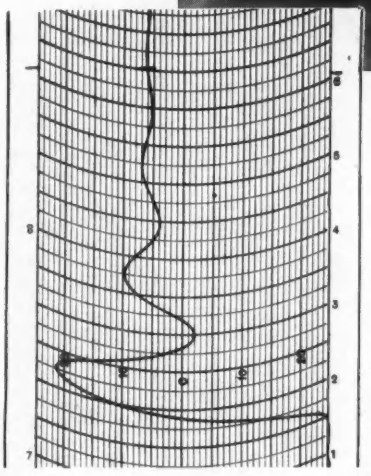
Using Everett Edgcumbe Super-Responsive "Inkwell" Graphers.
Critical Magnetic damping.
Low power consumption.

Chart speeds { Synclock motor drive up to 4″ per second. / Spring drive up to 12″ per minute.

	Model 'A'	Model 'B'
Response time	0·25 second	0·1 second
Minimum operating current	4 mA	15 mA
Power consumption for full scale deflection	0·03 Watt	1 Watt

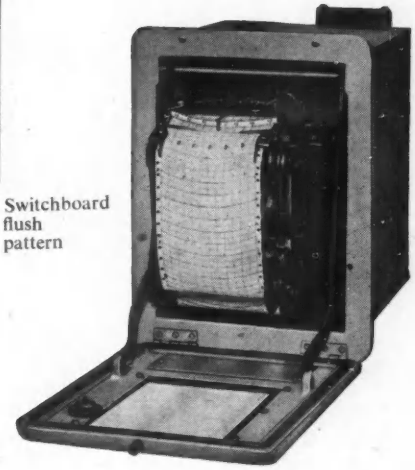


The "Inkwell" Super-Responsive Grapher is described in Catalogue Sheet 302E



An "Inkwell" pattern Super-Responsive Graphic Milliammeter is incorporated in the prototype Short Brothers and Harland Ltd. Analogue Computor shown above. It has a chart speed of 1″ and 2″ per second by Synclock drive.
A typical record from an "Inkwell" Super-Responsive Graphic Milliammeter is shown on the left.

Switchboard projecting pattern



Switchboard flush pattern

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Specialists in: Speed Recording, Photometry, Process Time Control, Telemetering.

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One [or more] of these leaflets is for YOU...

These three leaflets fully describe the wide range of standard DALY electrolytic capacitors. In general, the types listed will cover most requirements. Where specifications outside this range must be met, however, DALY will design and make special units to meet specific needs.

Behind DALY capacitors there lies 20 years of making only electrolytics, highly specialised experience which engineers throughout the world are finding invaluable, and which is readily available to you.

We shall be happy to send you copies of these leaflets without obligation.

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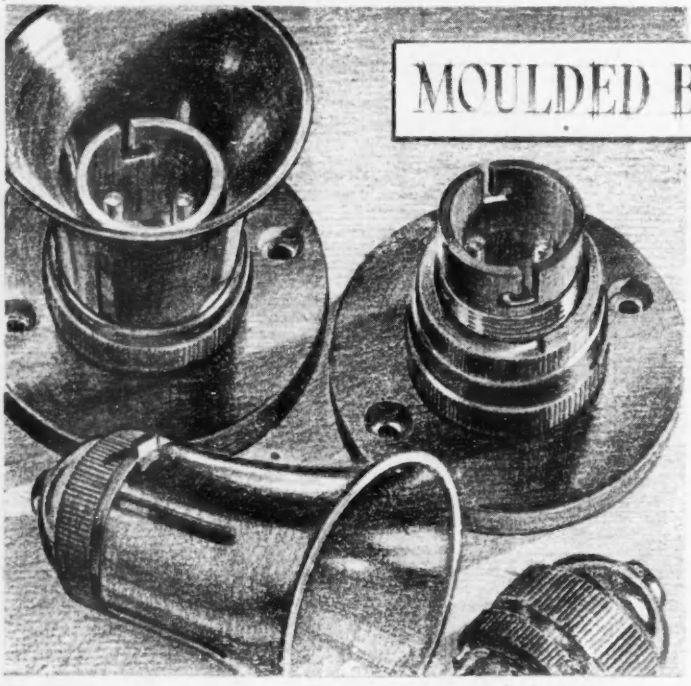

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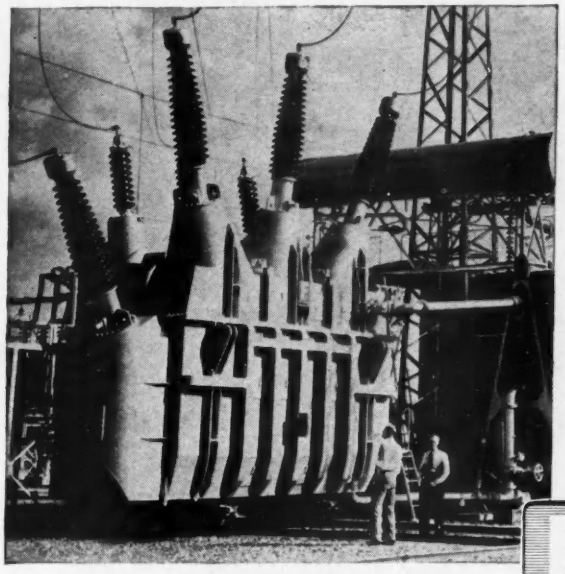
FERRANTI *in the east and in the west*



FINLAND

PYHÄKOSKI GENERATING STATION

Six Ferranti 230,000 volt three-phase transformers for the Imatra Power Company, Finland, were the first 230,000 volt three-phase transformers to be ordered in Great Britain. Each transformer is rated at 64/64/32 MVA, 231/115.5/10.5 kV and has a total weight, with cooling gear, of 220 tons.

One of the completed transformers in commission at the Pyhäkoski Generating Station.

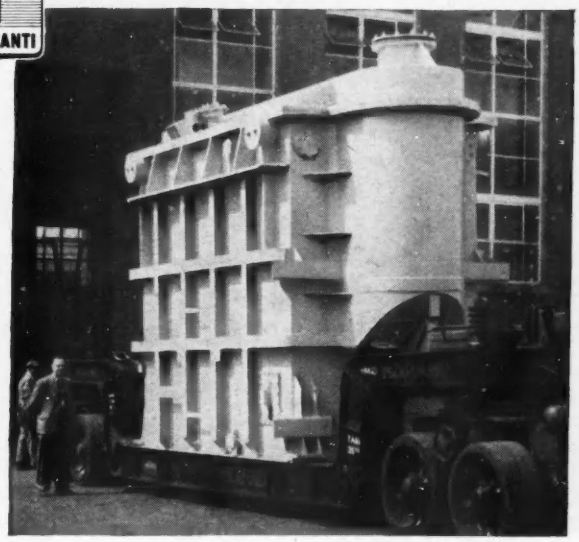
FERRANTI

CANADA

ALCAN PROJECT BRITISH COLUMBIA

Ferranti have received the contract to supply four 71,000 kVA, 301,400 volt - THE HIGHEST EVER MADE IN BRITAIN - single-phase generator transformers and three 37,000 kVA, 275,000 volt step-down transformers, for the Aluminium Company of Canada project at Kemano and Kitimat, British Columbia.

One of the 71,000 kVA generator transformers leaving the Ferranti Transformer Factory at Hollinwood, for Canada.



GARRISON DAM PROJECT. N. DAKOTA, U.S.A.

Nine 33,333 kVA, 230,000 volt single-phase transformers have been ordered by the U.S. Army Corps of Engineers.

McNARY DAM PROJECT, OREGON, U.S.A.

A contract from the U.S. Army Corps of Engineers, covers six 56,500 kVA, 230,000 volt single-phase transformers.

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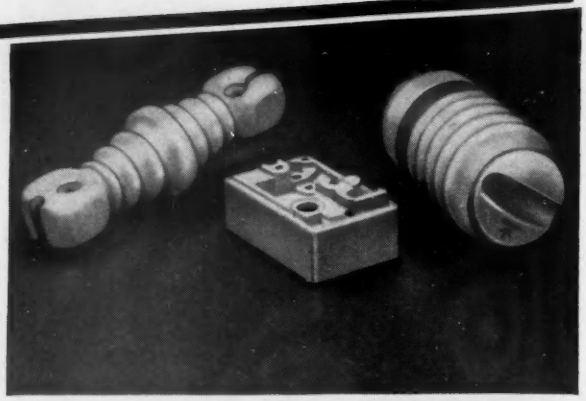

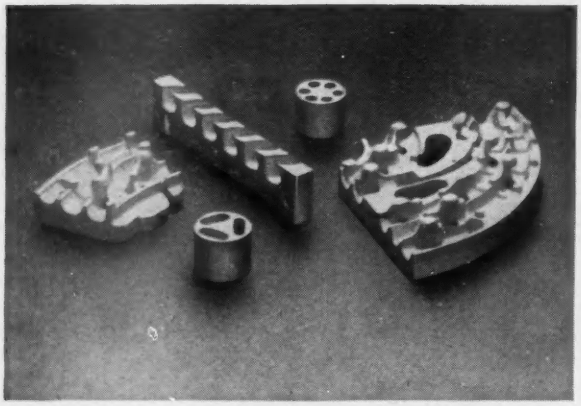

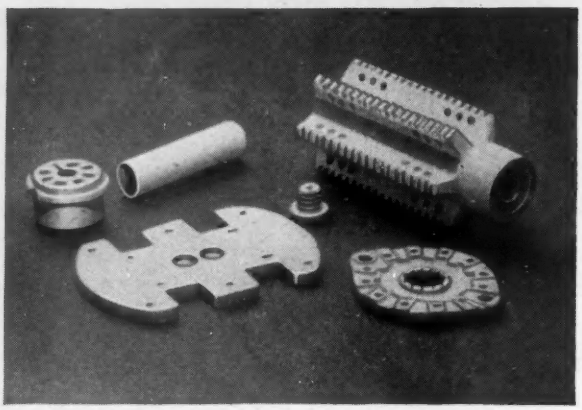

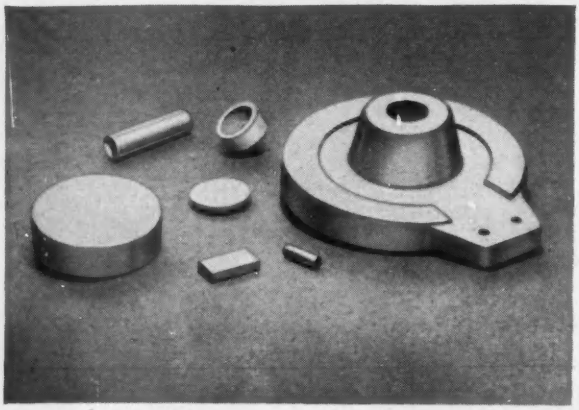

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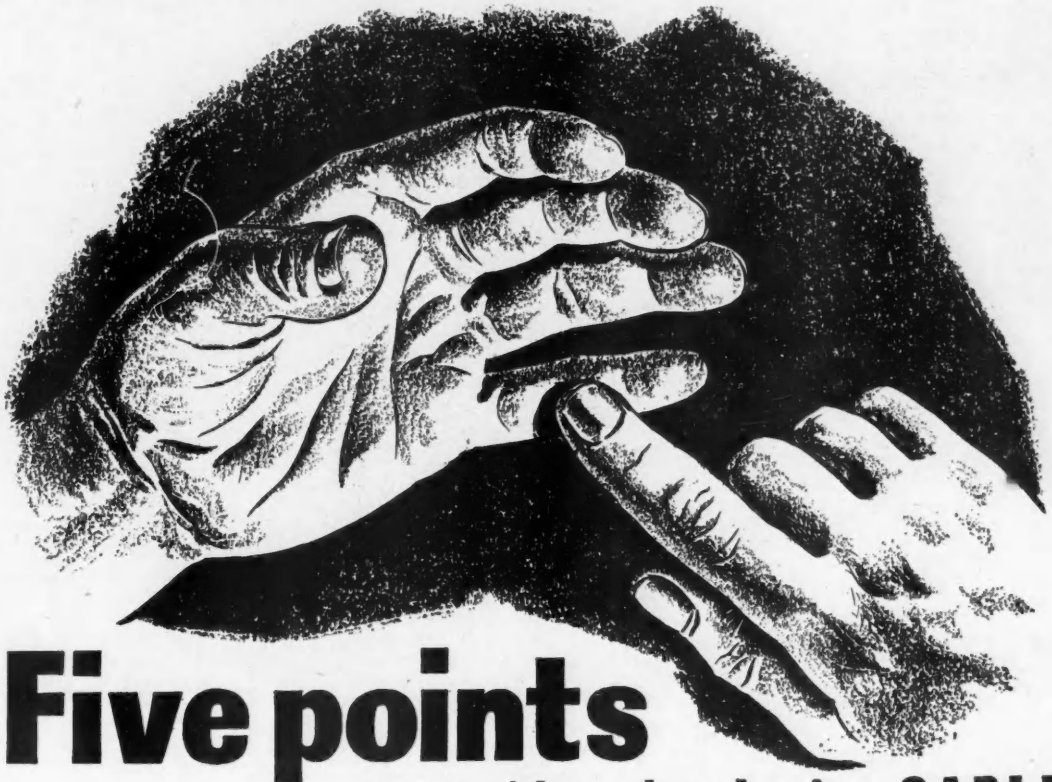

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1 QUALITY — Ashton cables and flexibles are manufactured to a high standard —BSS 7. 1953 under strict laboratory controlled conditions.

2 ELECTRICAL PERFORMANCE — the high grade materials used in Ashton Cables] ensure excellent insulation with a high factor of safety.

3 MECHANICAL CONSTRUCTION — Ashton cables will withstand rough handling, and are designed to provide trouble-free service under the most adverse conditions.

4 LONG SERVICE — Special Laboratory tests on Ashton Cables have shown that all the high electrical characteristics are maintained after years and years of service.

5 PRICE — Ashton Cables are competitively priced over the whole wide range of power and lighting cables and flexibles.

Ashton Cables and flexibles assure you of a trouble-free installation with that ample safety factor which is so essential.

ASHTON

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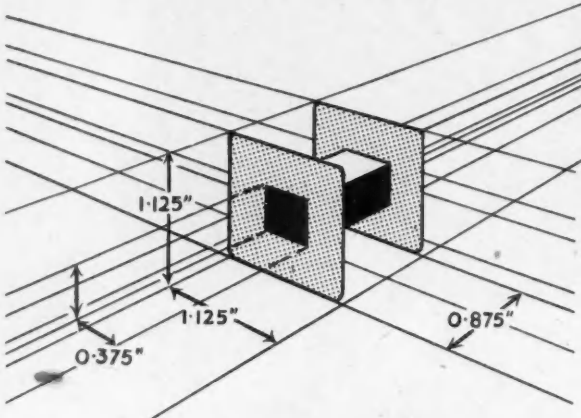

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We design and make the tools in our own works for the manufacture of precision-formed bobbins of high strength and low wall thickness.

These bobbins have a laminated structure with extremely high mechanical strength in relation to weight.

The specimen illustrated has a wall thickness of 0·014" and weighs one-sixteenth of an ounce. Such bobbins are suitable for continuous service at 150° C.

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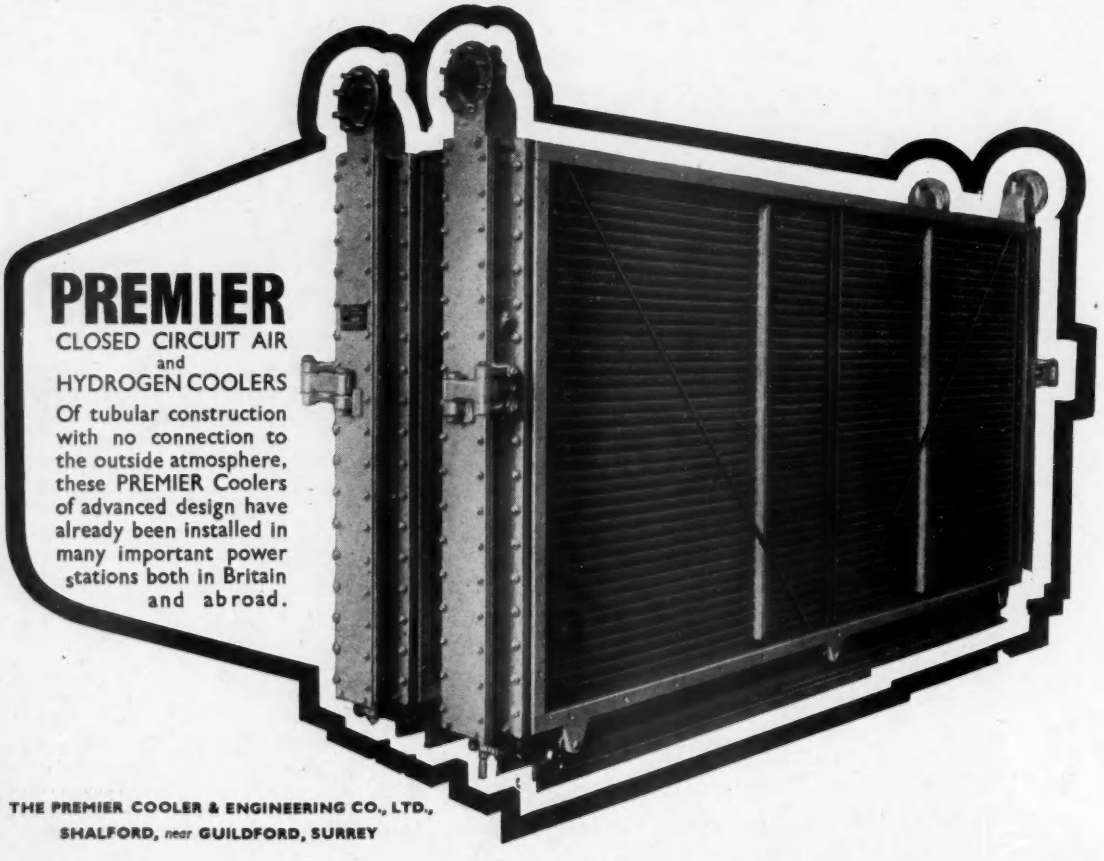

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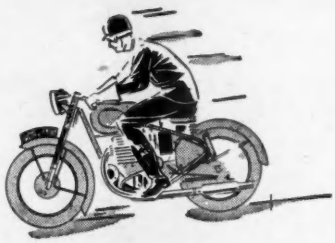

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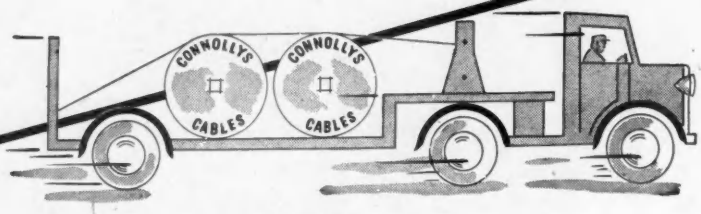

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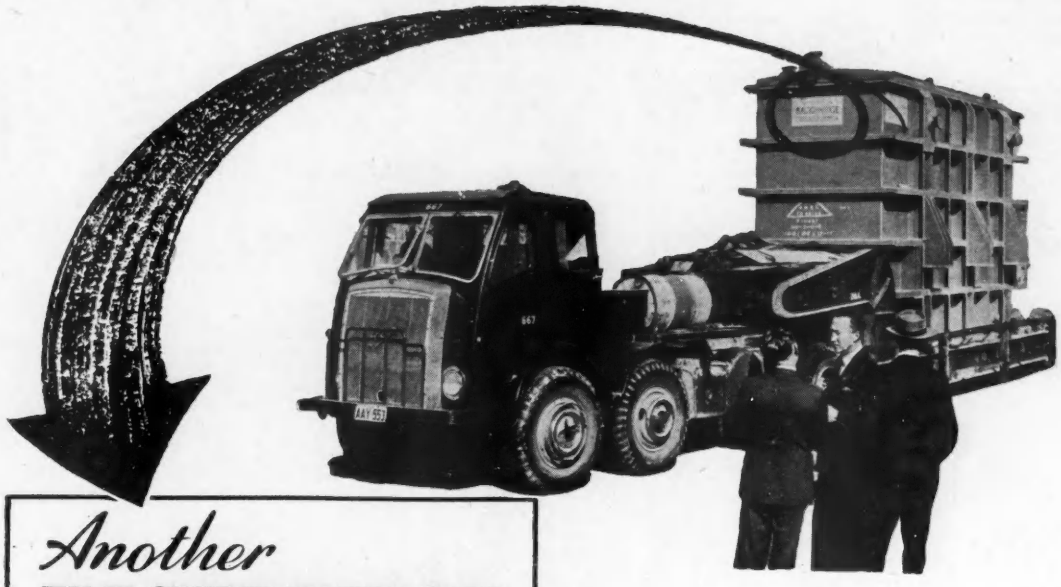

Another

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MONTH after month large Hackbridge transformers leave the Works for destinations extending to the most distant parts of the world. The illustrations show the arrival and installation of one of five 30,000 kVA 132/33 kV type ON/OB Hackbridge transformers for the Electricity Commission of New South Wales.

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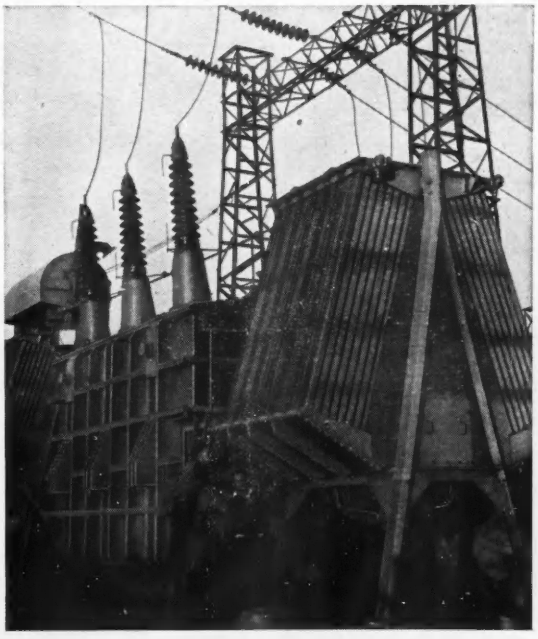

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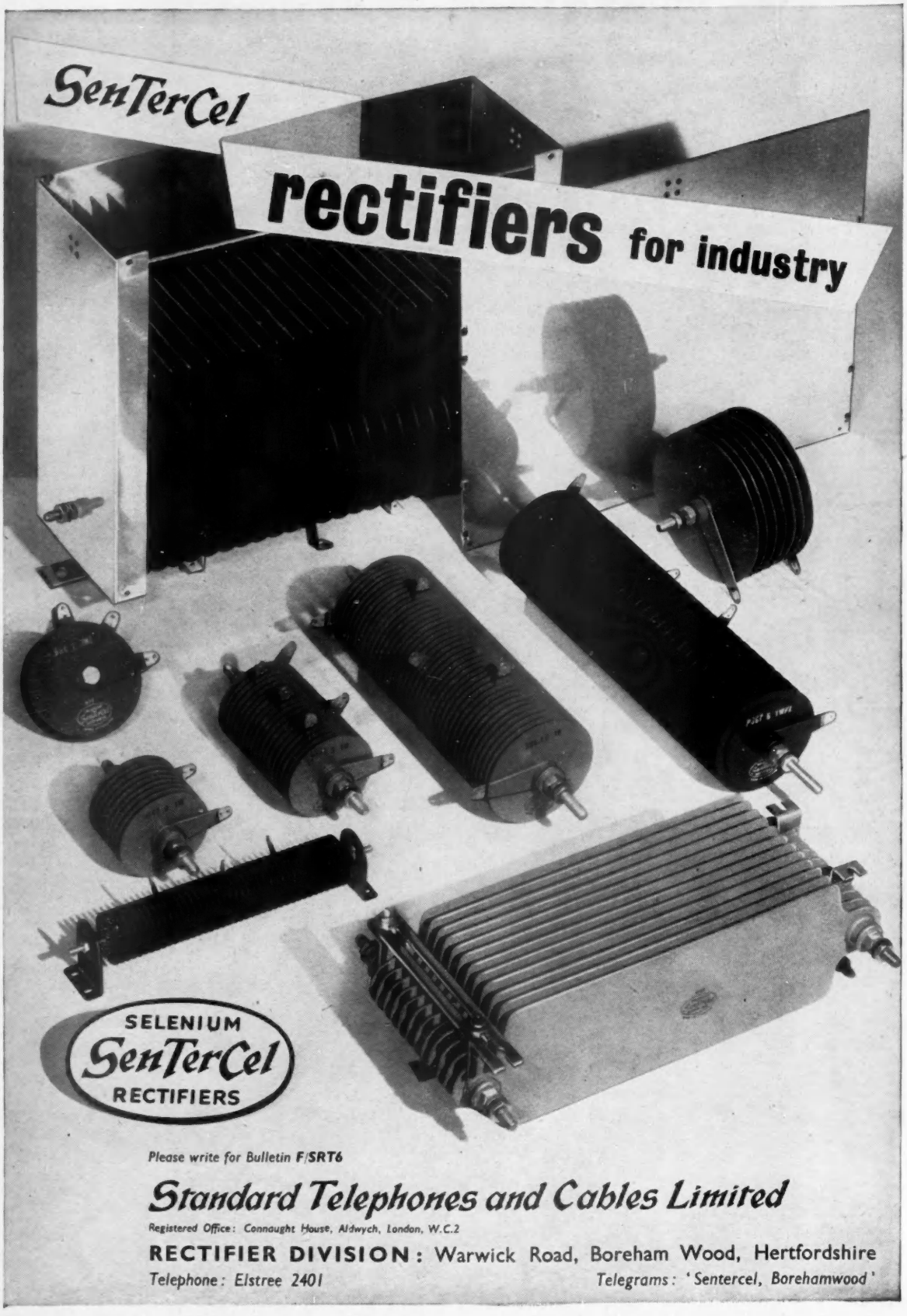

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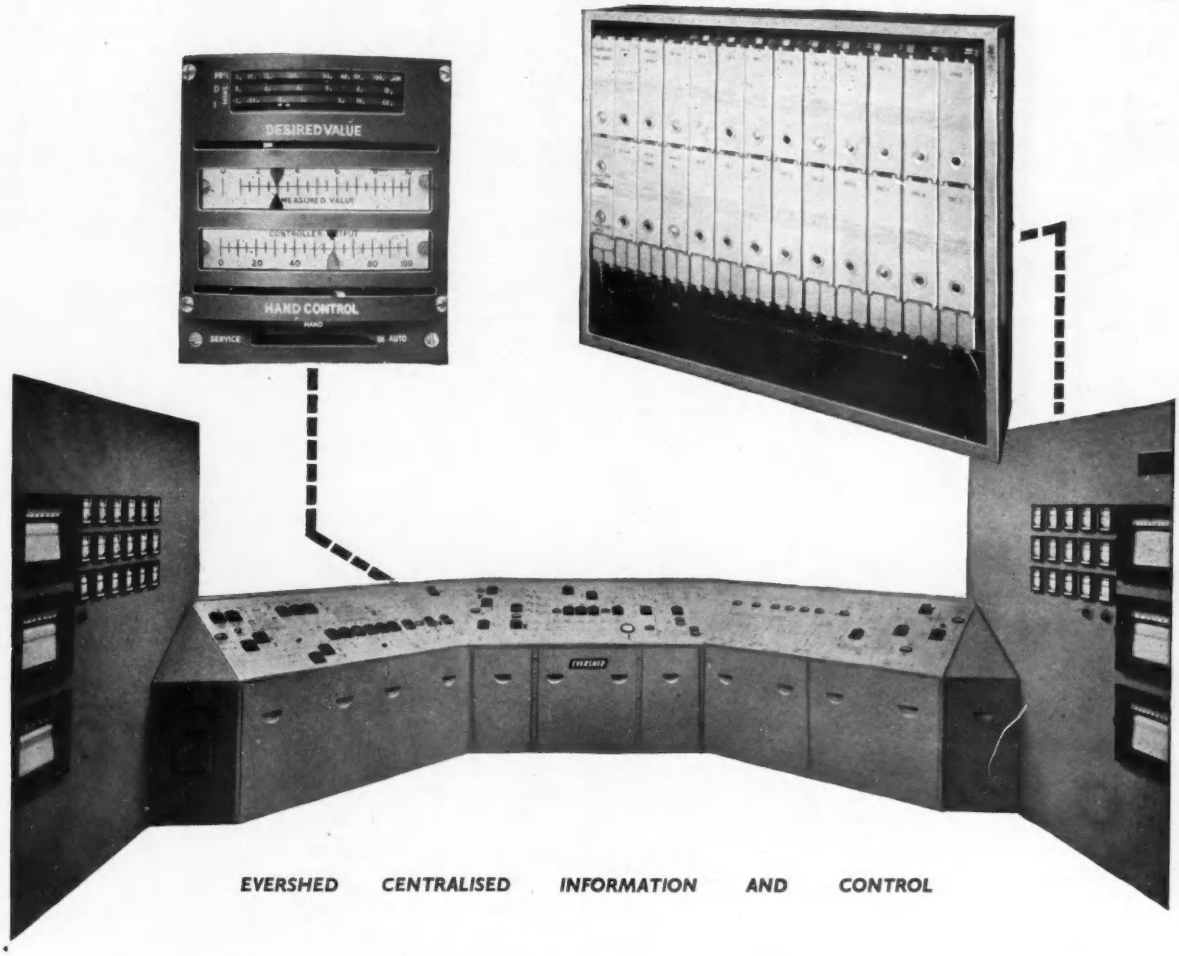

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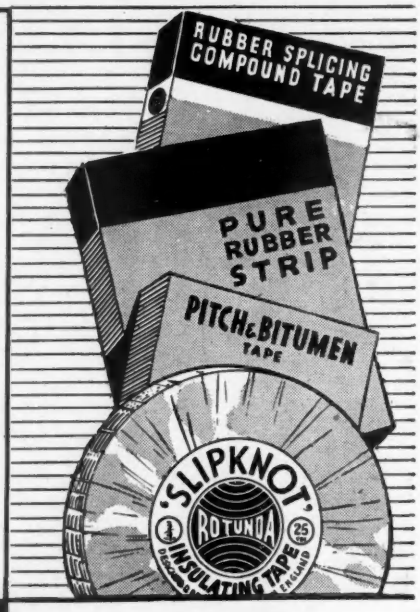

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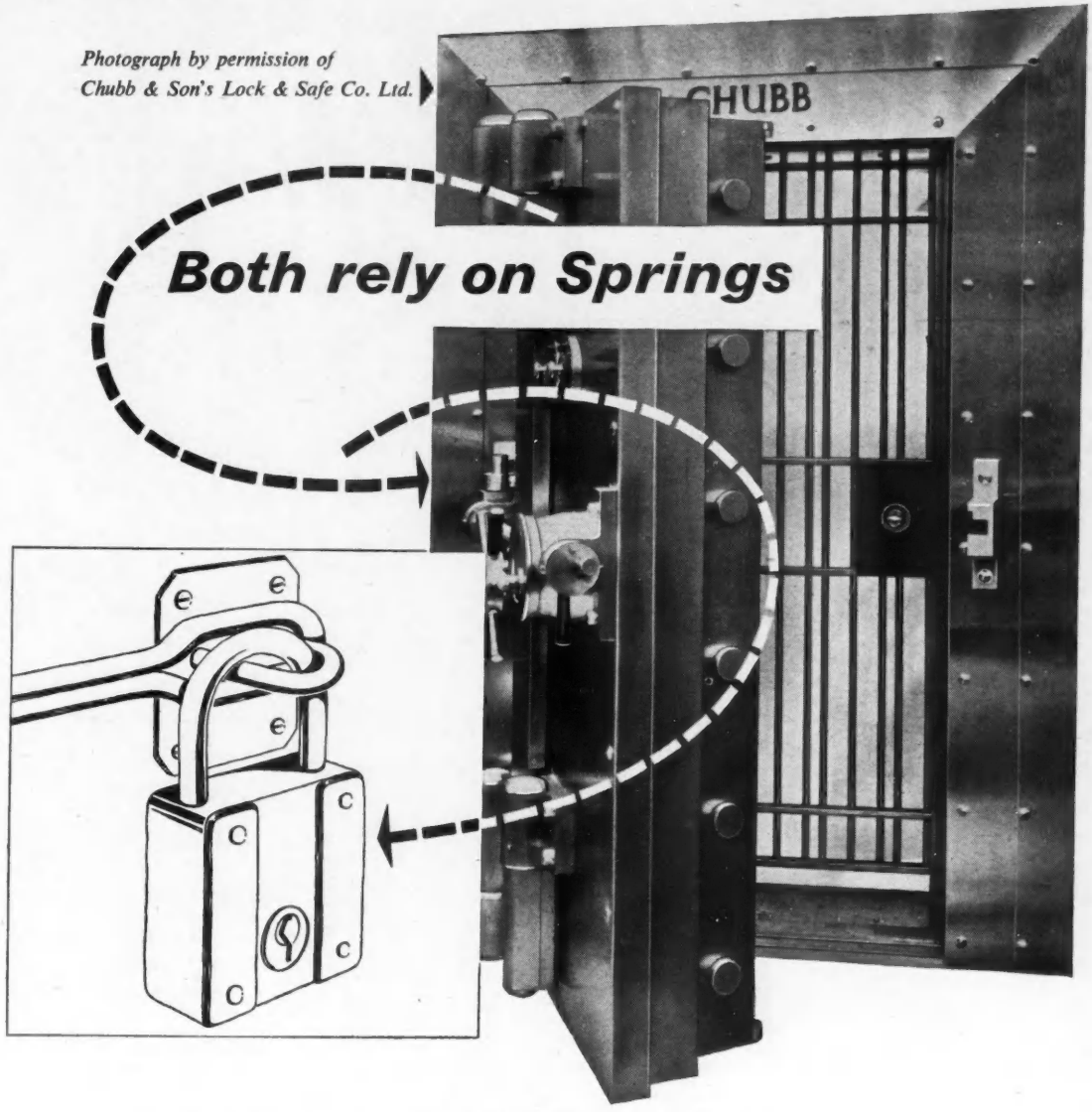

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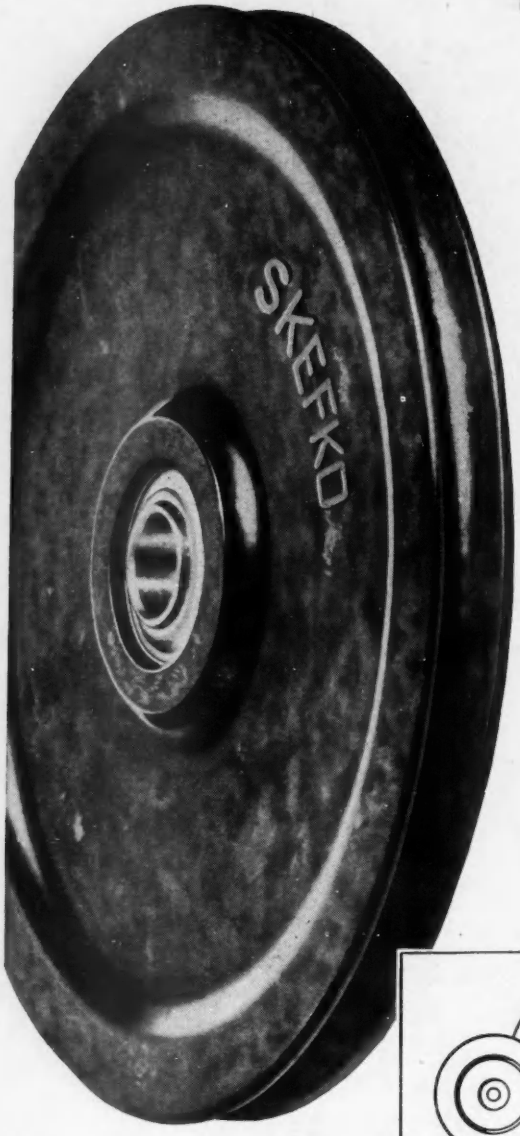

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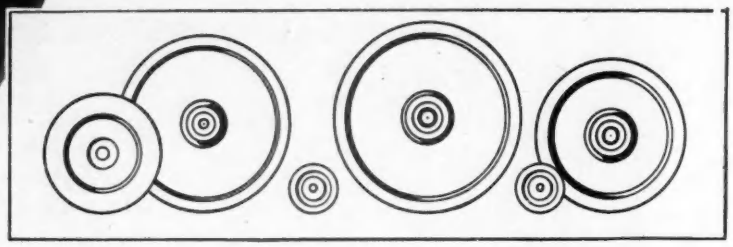

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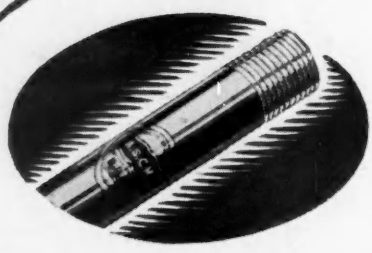

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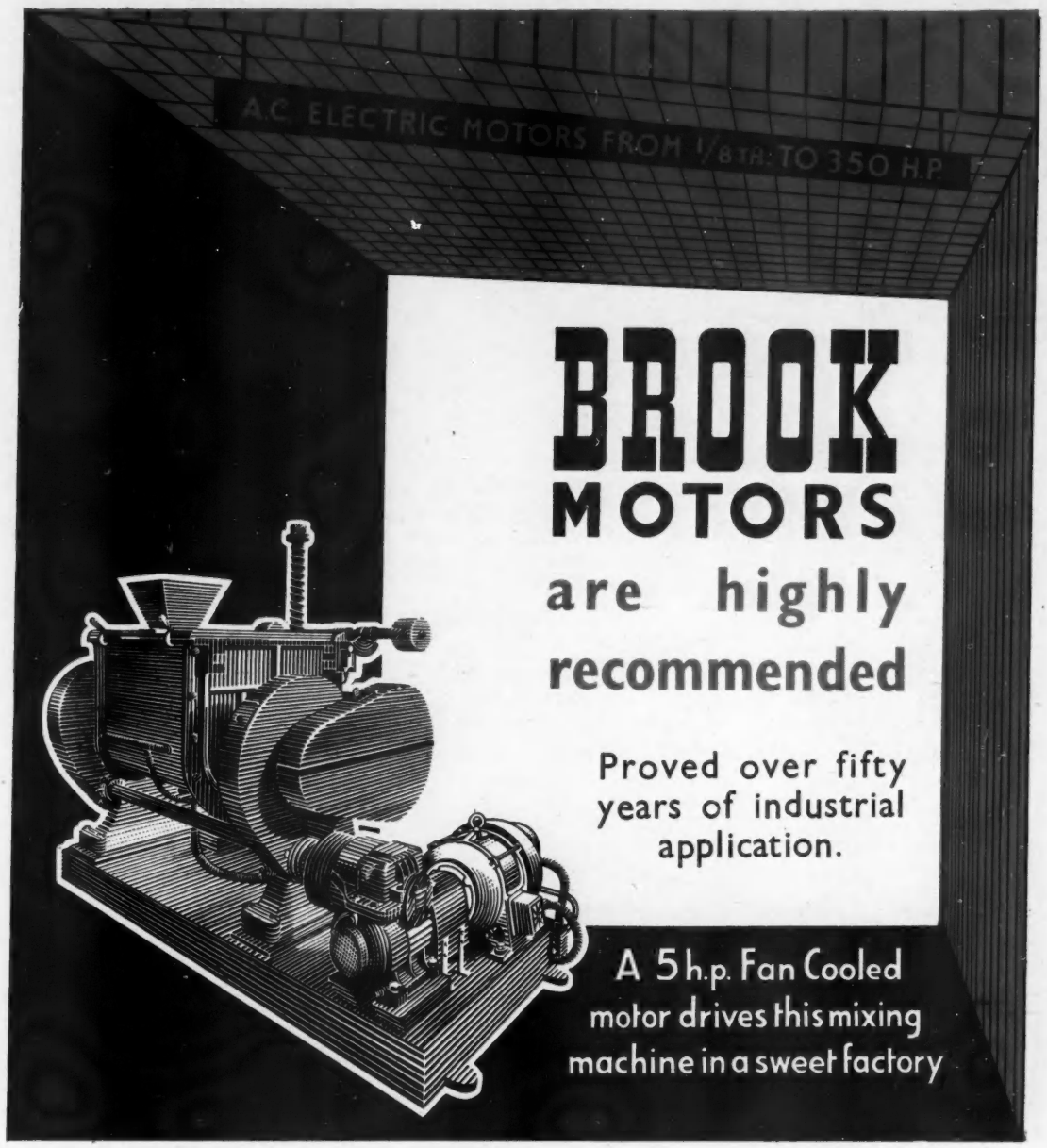

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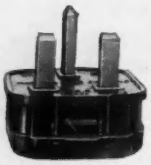

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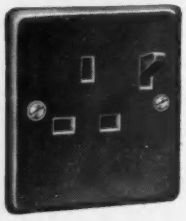

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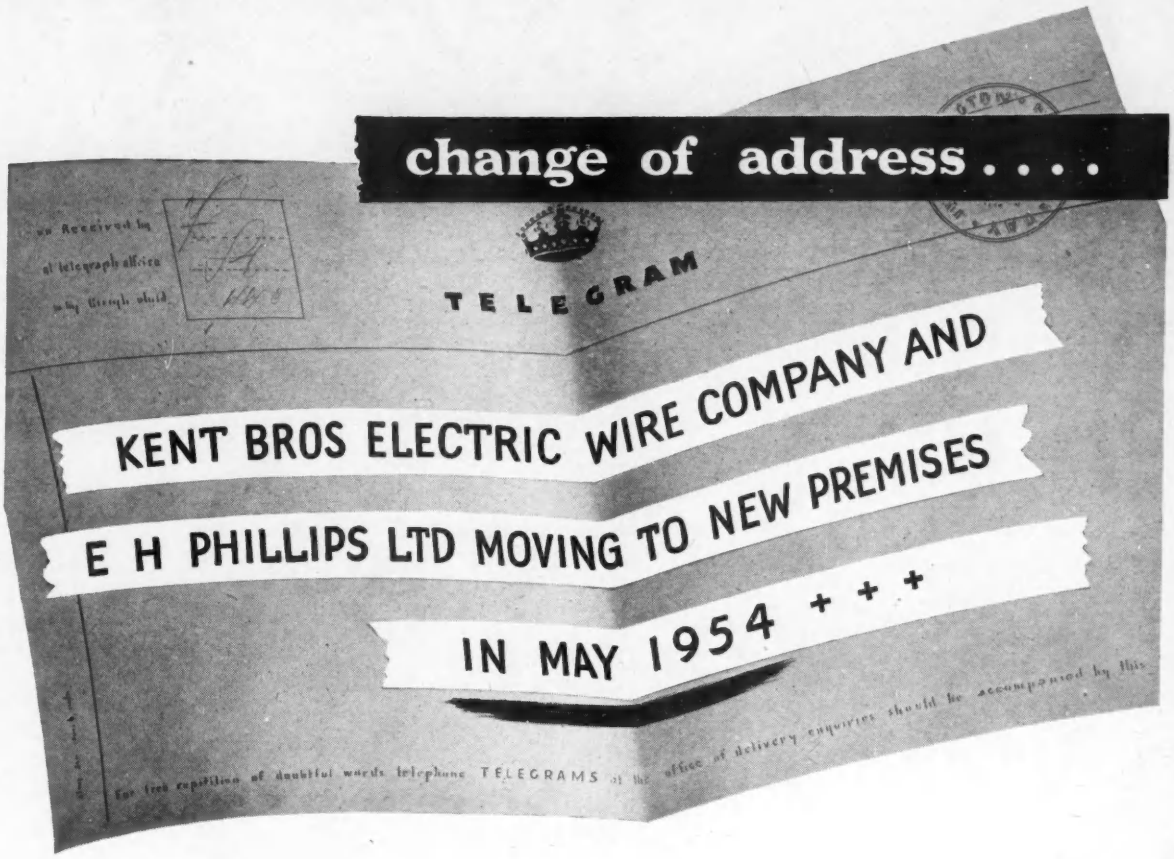

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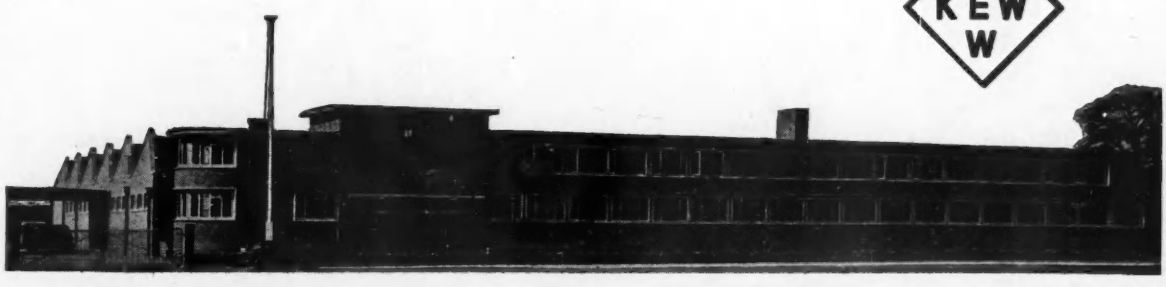

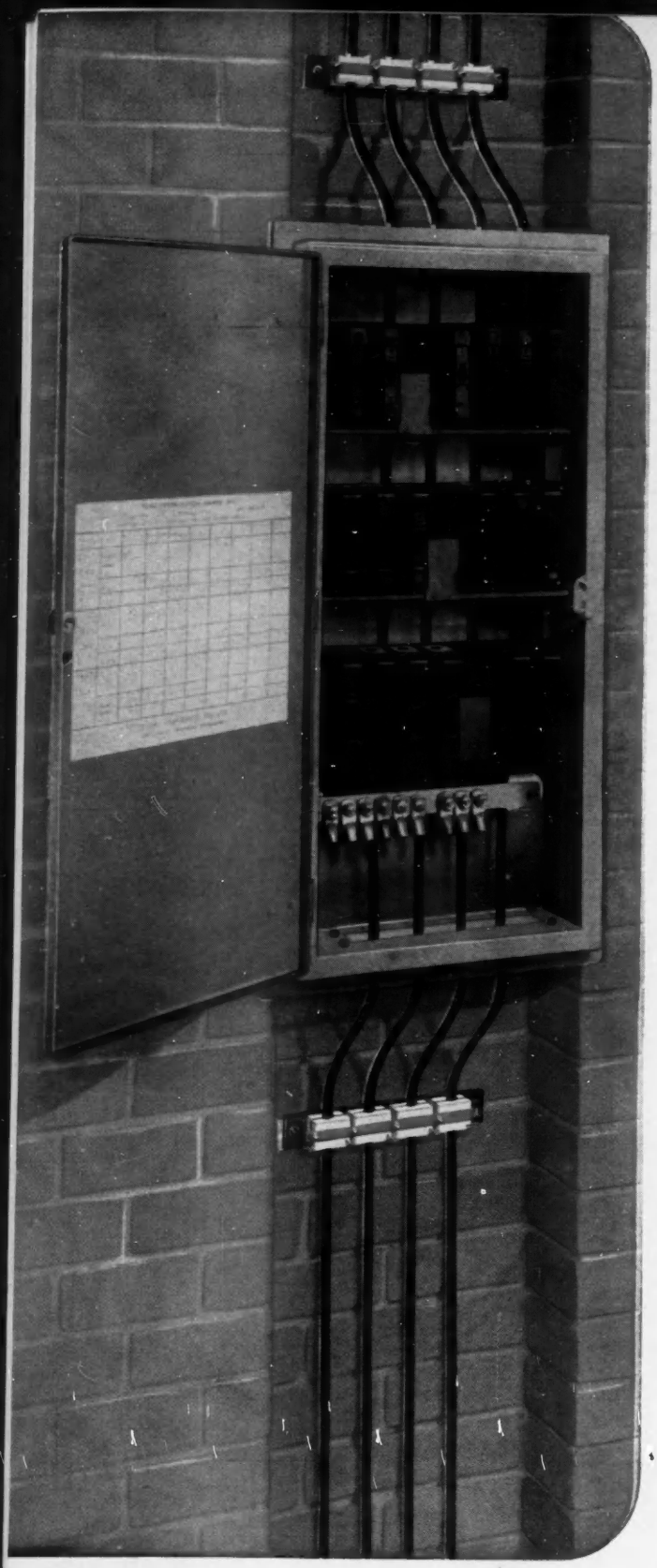

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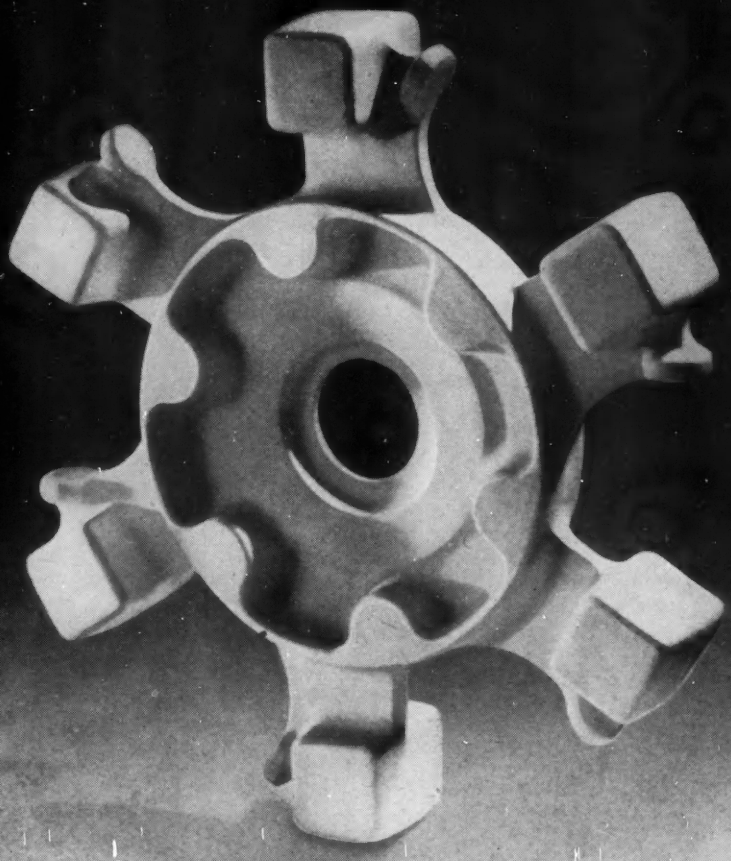

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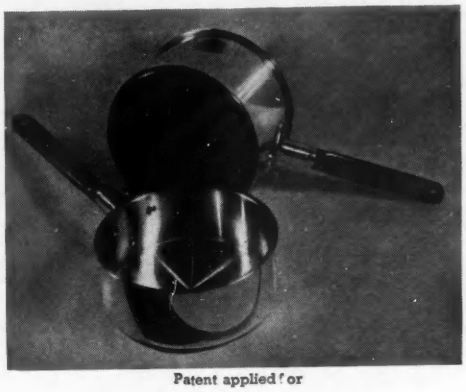
SC/30

The reasons why *Pyramid* Black Ground Base utensils

Speed your Cooking...



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It is well known that black surfaces absorb radiant heat faster than light or bright finishes which tend to reflect heat. The demand for quicker boiling times and consequently lower Electricity Bills has been met. After more than a year of experiments PYRAMID present the new BLACK GROUND BASE range of quality utensils for use on cookers which have both Radiant and Solid hot plates. Rapid boiling, functionally designed, and built to traditional PYRAMID QUALITY Standards, this new heat absorbing BLACK GROUND BASE Range will be indispensable to those women desiring maximum speed and efficiency from their cooker.

Here's proof of NEW cooking economy!

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		2 pts.	3 pts.	4 pts.	5 pts.
Light aluminium	1,600 watt radiant	8·42	11·25	13·05	15·30
Light aluminium	1,800 watt solid	10·02	11·55	14·25	17·50
Ground/black-base aluminium	1,600 watt radiant	7·28	10·03	11·45	14·16
Ground/black-base aluminium	1,800 watt solid	7·32	9·54	11·25	13·50

Our ability to meet your requirements and to build prestige through every sale is determined largely by our technical improvement policy: that is, the assistance we give you and your customers through our developments in utensil efficiency. Tested and proven, the new PYRAMID Black Ground Base utensils for electric cookers fitted with Radiant and Solid Plates are a very special part of that service, appealing quickly to a growing demand and building your sales through speed, efficiency and a reputation for leadership in the Development of Quality Utensils.

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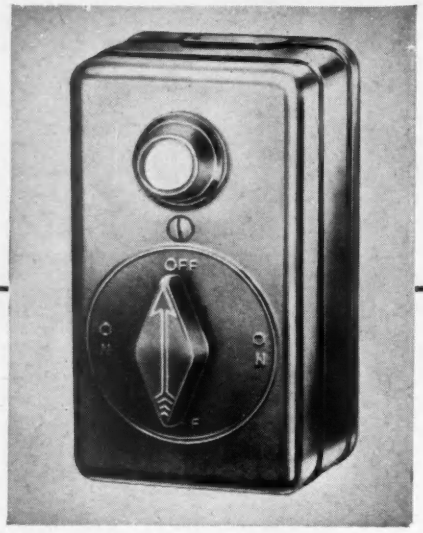

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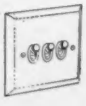
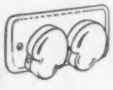

TUMBLER SWITCHES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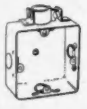
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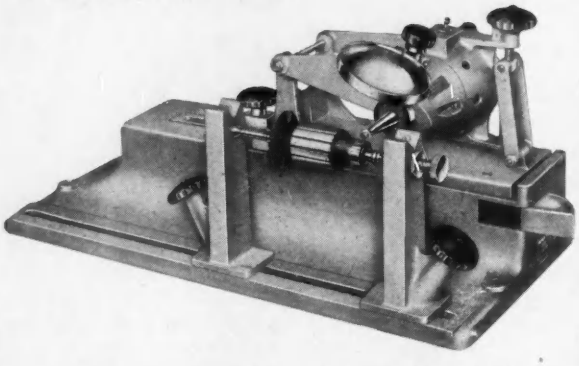

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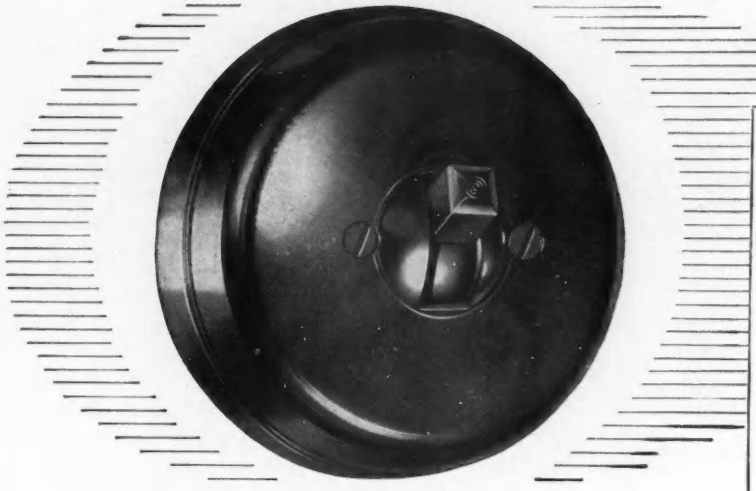

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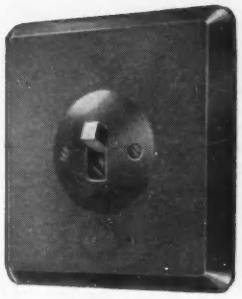

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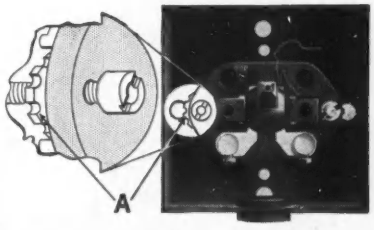

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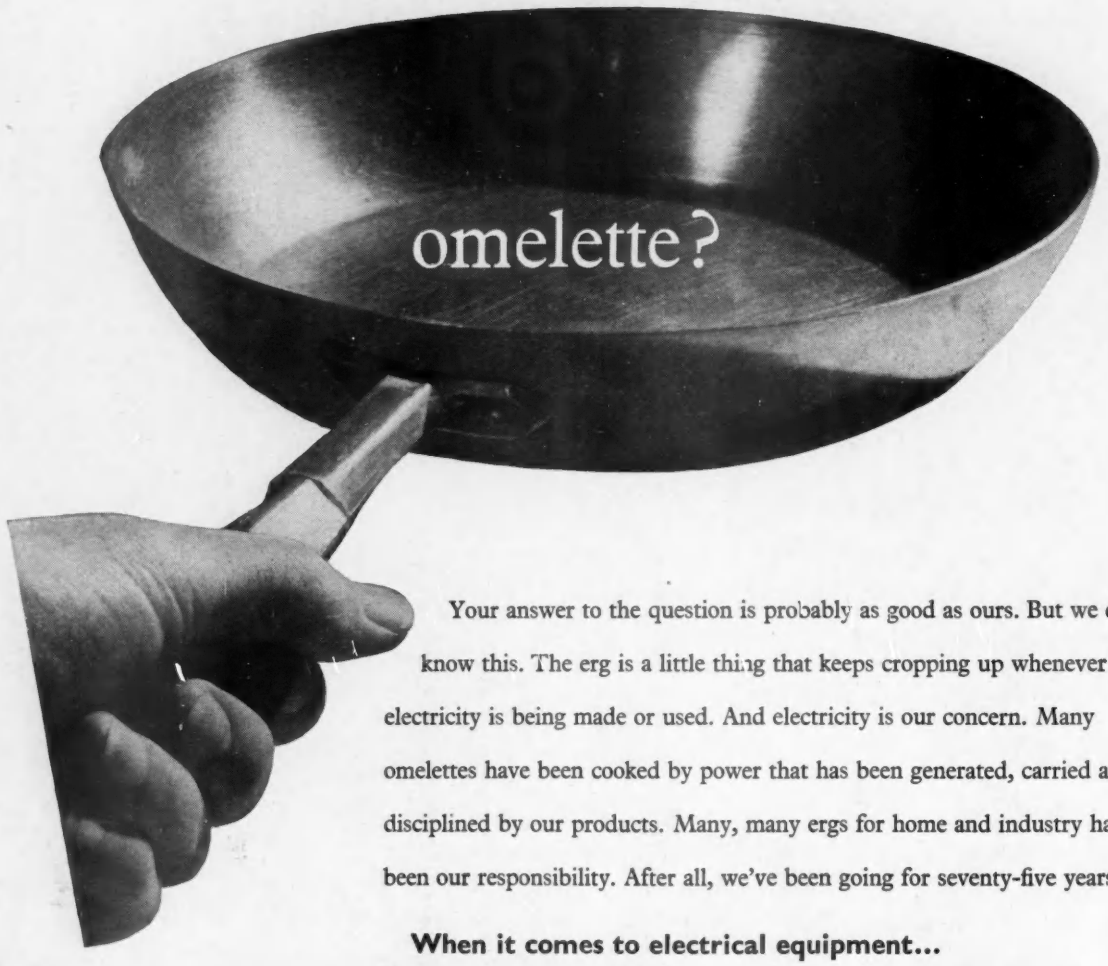

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*A footnote to remind you that the erg is the measurement of work done by the force of one dyne acting on a body through a distance of one centimetre. Take an erg to the seventh power of ten and you've got a joule, which is the work expended in a second by a current of one ampere flowing through one ohm . . . but why should we let that bother you?

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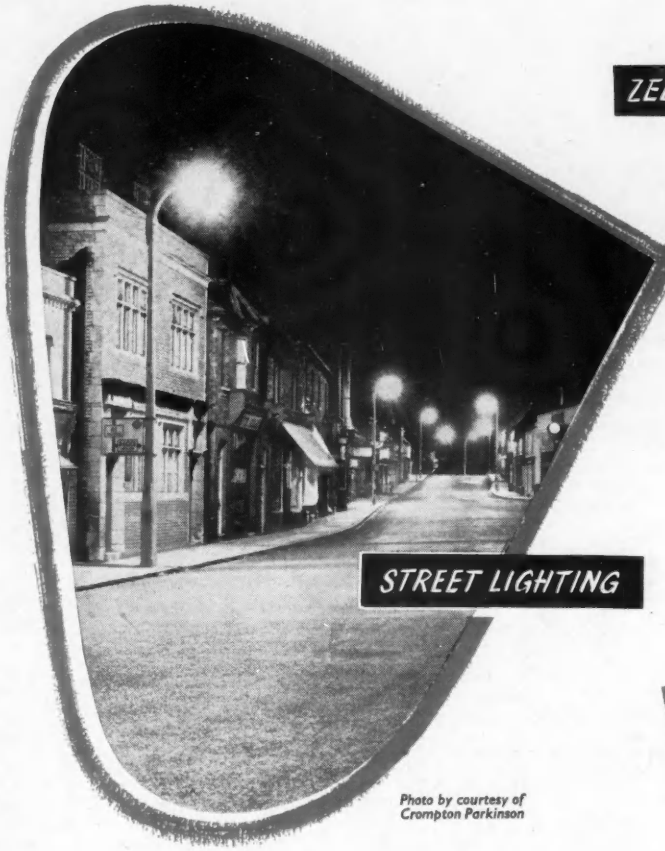

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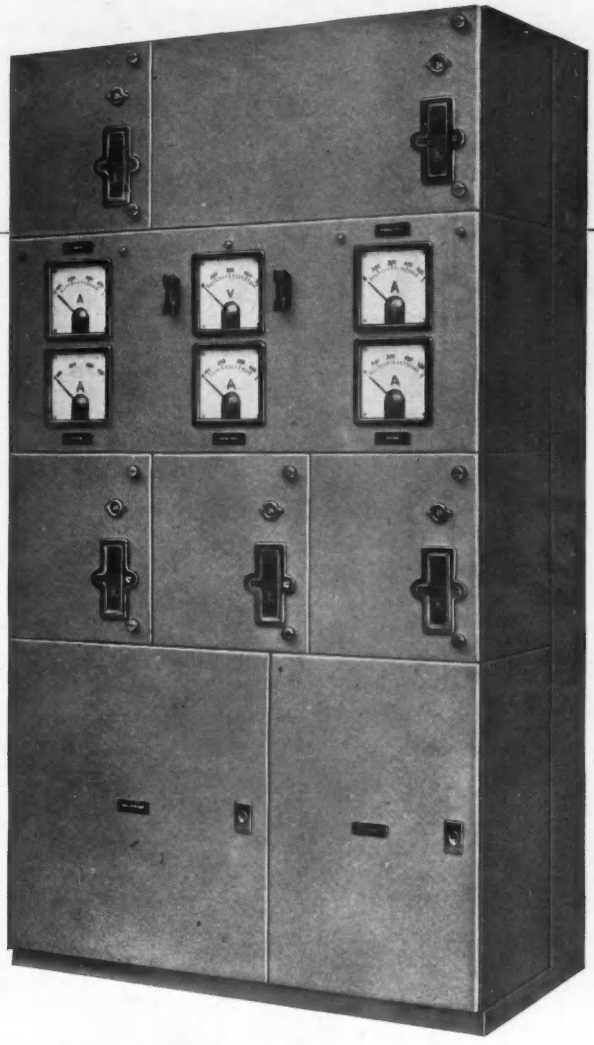

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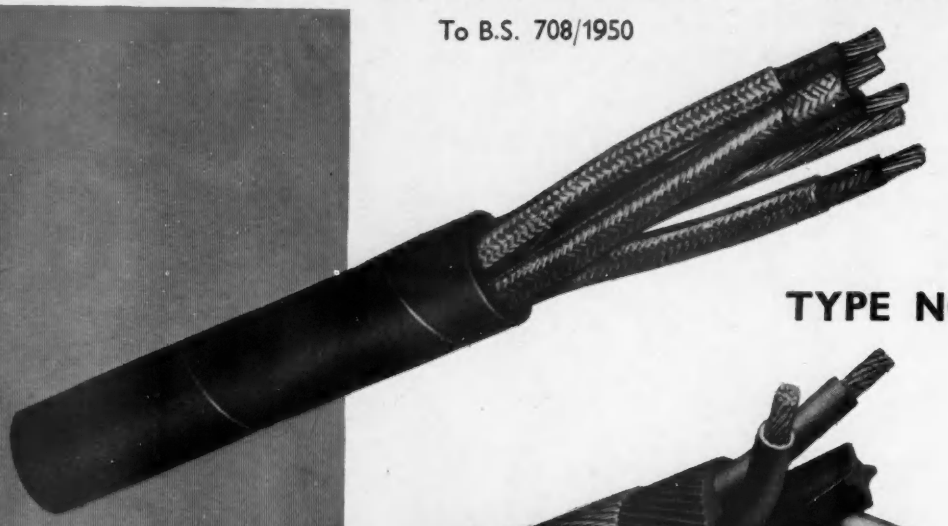

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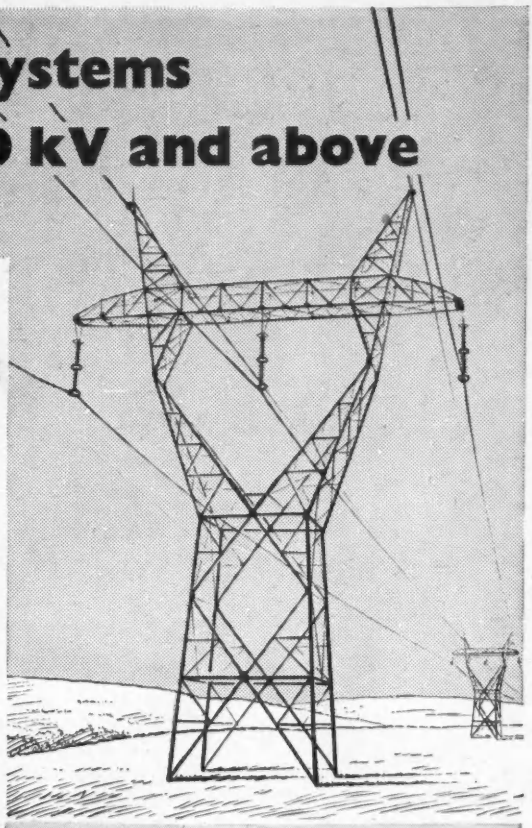

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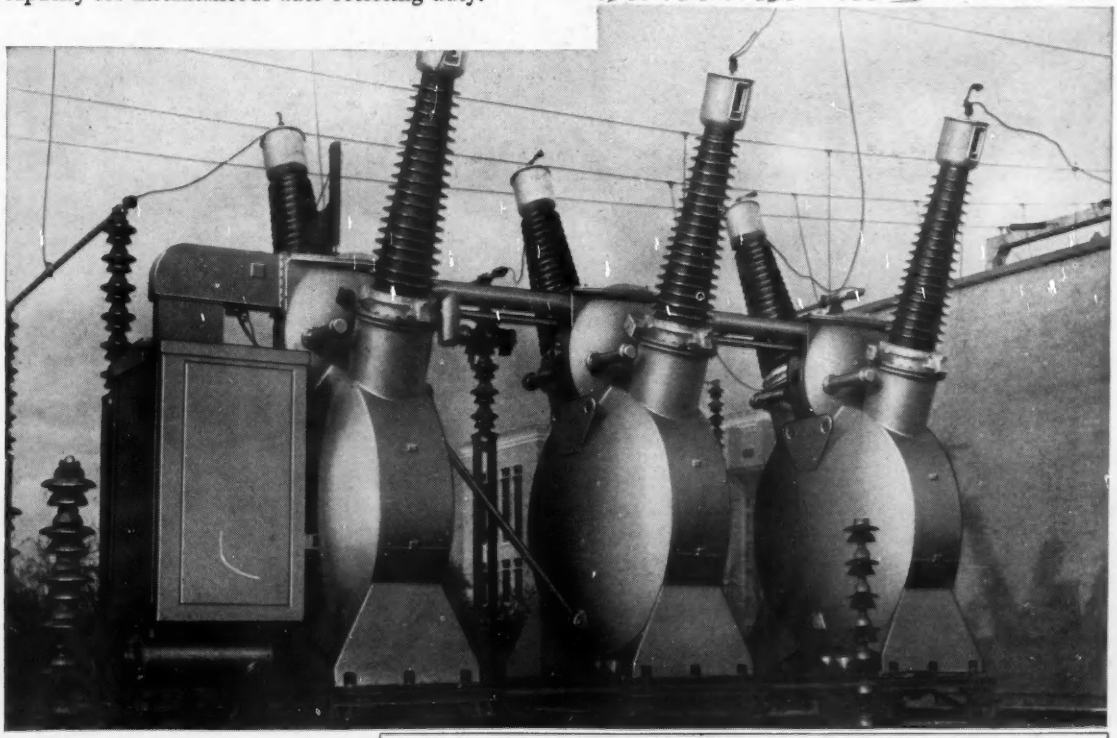

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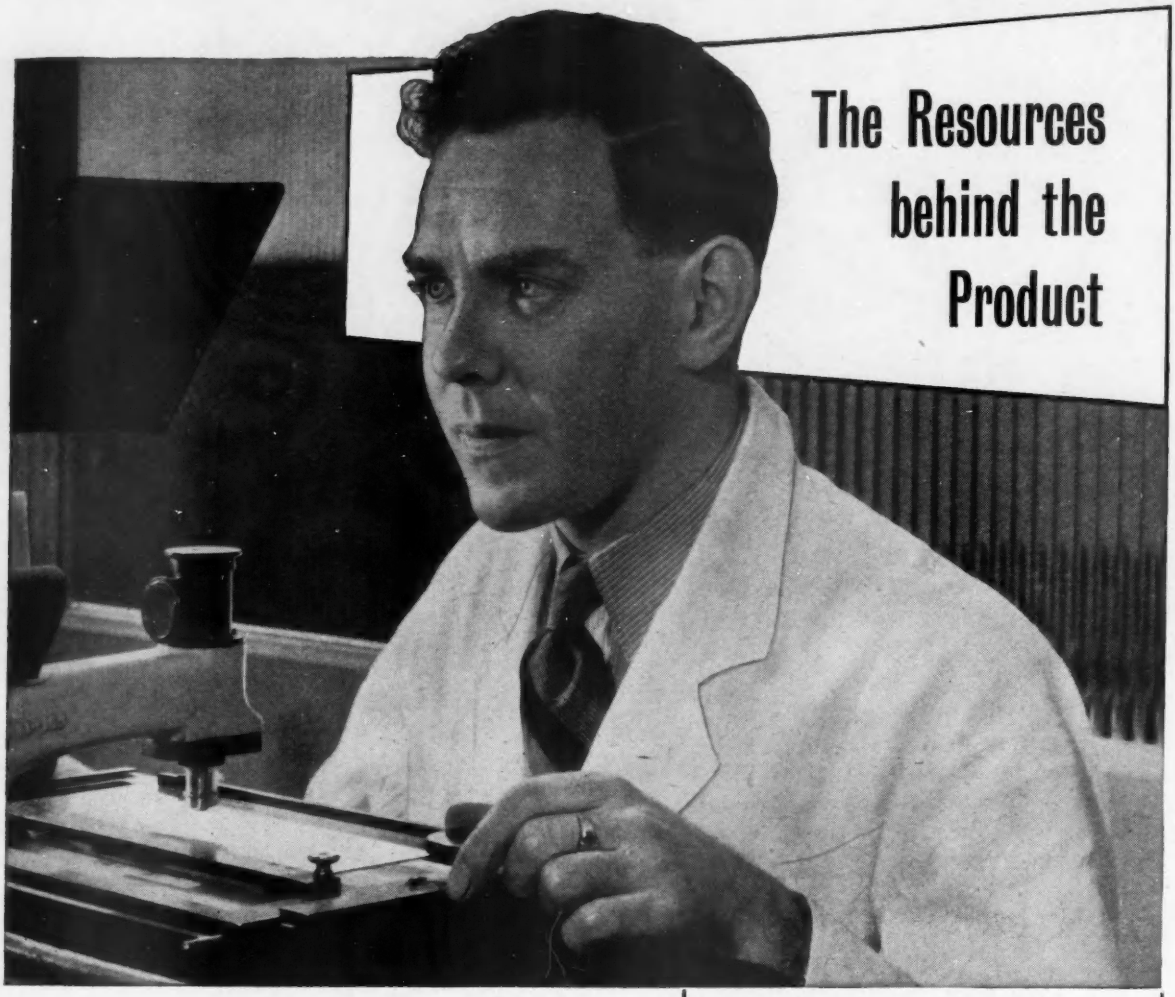

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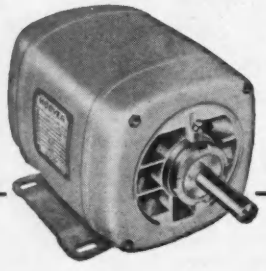

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ELECTRICAL TIMES

ESTABLISHED 1891

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D

DECISION FOR CABLEMAKERS

For five years now, the Cable Makers' Association and its associates have been involved in a Monopolies Commission enquiry. Three years were spent on the investigation of the industry, and, since the publication of the Commission's report, there have been two more years of discussions and consideration by Government departments. The result is a bald Government announcement that nearly all the recommendations made in the report have been endorsed, and that the cablemakers have until the end of the year to put them into effect, under the direct threat of a compulsory Order. This is a bitter and unsatisfactory conclusion to such labours, the more so since there seemed a strong case for at least modifying some of the Commission's more extreme findings, made under the influence of the now moribund White Paper on Resale Price Maintenance. They included the abolition of systems of common prices for rubber cables and the introduction of special Government supervised arrangements for pricing mains cables, as well as the ending of exclusive dealing agreements and aggregated quantity discounts of various types. The recommendations that the Government now intends to impose must sap most of the corporate strength of trade associations which, as the Commission itself was forced to recognise, have played a predominant part in establishing the world-wide reputation and the export trade of the British cable industry. Can it be wise to sacrifice all this on the altar of anti-trust principles, with no tangible compensation for the risk incurred? With the Monopolies Commission still engaged on a consideration of the whole wide question of exclusive dealing and similar aspects of commercial practice, it would surely be wise for the Government to think again, rather than prejudge an issue which they themselves selected for investigation.

C.I.G.R.E. IN SESSION

Although the outward form of the C.I.G.R.E. High Tension Conference continues along the familiar lines that have led to the pre-eminent position it holds today, it is possible to detect certain subtle changes that have taken place over the course of post-war conferences. The discussions themselves reveal that certain conflicting viewpoints have been aligned in the course of the years and if some of the meetings are less lively than those of 1946 it is unquestionably the Conference itself and the associated study committees, that have helped towards such international agreement. Inevitably, there remain major differences in certain spheres less easy to reconcile, resulting either from remaining opposite viewpoints or from

geographical conditions. The growth in size of the Conference has also led to changes of accent. In consequence of the larger number of delegates, sectional interests now appear more marked, particularly with joint session meetings and an increase in commercial interest at the Conference is becoming noticeable. The social side has also grown in volume, and although official functions are still limited, the number of private occasions appears on the increase. Many more ladies were present this year, a factor which the organisation recognised by providing ample facilities for keeping the ladies busy during sessional time. Taken together these points show the changing character of C.I.G.R.E. and perhaps show a cautionary indication to the Council of possible dangers arising from ever growing membership.

IMPULSE TESTING

A subject continuing to arouse much discussion among high-voltage engineers is that of impulse testing of power transformers. Such testing has for many years been carried out by research laboratories, and it is now practicable to apply surges of the "chopped-wave" type which will simulate the conditions of a transformer when a surge has flashed-over the co-ordinating gaps. There is, however, a growing trend to apply such testing as part of acceptance tests, as well as for use in the detection and location of faults. Such a routine procedure is open to argument. Indeed, in the opinion of one of the speakers in this year's C.I.G.R.E. discussion on the subject, it was likely that with chopped-wave testing, the transformer might be subjected to stresses of greater severity than those that would arise in practice. While, therefore, from the point of view of the designer and research engineer, the use of impulse testing is of significance particularly as a means of searching out and locating faults in the windings of transformers, the purchaser also requires assurance that the insulation has not been so stressed that it is possibly weaker electrically than it was before such testing is carried out. Many engineers have even ventured the opinion that once type-testing of a particular design has been carried out—possibly to destruction—careful inspection and scrupulous attention to cleanliness during manufacture of similar plant would be sufficient to ensure satisfactory practical operation.

A START IN RHODESIA ?

Sir William Halcrow's broad-sweeping address on engineering developments in Central Africa, delivered to the Royal Society of Arts last week, has come at a moment when the great hydro-electric potentialities of the Federation of Rhodesia and Nyasaland are coming into the news once more. It has seemed in recent years that territorial disagreement about which of the two major generation schemes based on the Zambesi system should be commenced first would seriously retard a start on either. The Kafue River scheme in Northern Rhodesia offers initially cheaper power more quickly, but the Kariba Gorge project in Southern Rhodesia has the counter advantages of a far greater ultimate output and a considerable long term saving in costs. Since the long discussed federation of the territories has been accomplished, the whole question has taken a new political turn. Yet, as Sir William emphasised, the essential point remains, that if the industrial power of Central Africa is to grow, the two schemes must be regarded not as rivals, but as complementary features of a grand design. The announcement last weekend that the Federal Government is taking action to set up a five-man board charged with promoting the necessary schemes is a welcome indication that a start may soon be made.

CONCERN ABOUT COAL

Publication of the National Coal Board's 1953 report has coincided with the advance rumblings of what may well become another period of acute anxiety regarding coal supplies. So far this year, coal output is slightly down on the corresponding total for 1953, instead of being 2½% up as had been planned, while overall stocks are little different from those available at the same time last year, in spite of the greater demand that must be expected when the coal winter begins in October. So far as generating stations are concerned, stocks show no advance on last year's levels, despite an 8·5% increase in generating capacity, and of a significant drop of 1·4m tons in the central reserves of opencast coal. The failure of coal output to rise significantly cannot be other than disappointing, especially as 1953 was a record year for capital investment in the industry. The £200m invested in the mines since nationalisation should surely be showing some effect by now, even though the Board in its report emphasises that capital investment has been running at too low a rate. One difficulty appears to be the admitted lack of engineers on the planning side of the mining industry; but to put such matters right will need years rather than months, and it seems that some special measures will be needed in the coming weeks to avoid trouble this year.

FLUORESCENTS AT HOME

Although the fluorescent lamp has become firmly established in industry and commerce, it has made little impact on the home. It is occasionally used in kitchens, and there may be a few all-fluorescent domestic installations, but for the great majority of us, this admittedly efficient and effective modern light source is left behind at office or factory. What are the chances of a change in this situation? The authors of a paper presented at last week's summer meeting of the Illuminating Engineering Society hold out hopes for an eventual increase in the use of the fluorescent lamp in the home. The technical interest of this opinion lies in the necessary prerequisites which they specify: a shorter tube, colour nearer that of tungsten, an effective and silent instant start mechanism, availability of attractive fittings, and —most important but most difficult to obtain—a much lower price. Since colour preferences provide the immediate obstacle, the recent introduction of the deluxe warm white lamps is an important step along this path, but it is surely price that holds the ultimate key to the situation. It still remains to convince the general public of the advantages of reasonable standards of lighting of any type. Until this is done, the cash to pay for the advantages of fluorescent lighting is unlikely to be found.

Meteor

Discussions during the first week of the High Tension Conference held in Paris

THE opening ceremony of this year's International Conference on Large Electric Systems (C.I.G.R.E.) took place under the auspices of Mr Louvel, French Minister of Industry and Commerce, and was held as is usual, in Paris. Speaking at this ceremony, the Minister said that having himself been connected with the electrical industry, he knew the importance of the delegates' work, and the beneficial results which arose therefrom. He also knew that much of the world progress in this field was due to the long and deep collaboration which CIGRE had established between electrical engineers throughout the world. At a time when nations were seeking to achieve greater co-operation in knowledge, the Conference provided a magnificent example, approaching perfection, of an international organisation. To it came eminent men from the majority of countries throughout the world. Their enterprise knew no bounds, and each session produced a new surprise. Four years ago it was the Messina Straits crossing at 220 kV; two years ago the 380 kV Swedish long-distance transmission system went into operation; this year there was the commissioning of the 100 kV d.c. submarine cable at Gotland. The time was coming when another submarine link under the Channel would connect England and France.

When one thought of what those works meant in terms of research, labour, experience and calculation, one was confounded by the breadth of human intelligence which led to their successful conclusion. Above all, however, was the prospect of atomic energy which would certainly occupy one of the meetings in the near future. Thanks to the electrical engineer, electrical energy had taken a place in modern life which would have been inconceivable to our forefathers, even at the beginning of the century. It was this energy on which life now depended in most countries. Chemistry, metallurgy, transport and more and more industries were becoming dependent on electricity.

Our heading block shows the President's table at the opening ceremony Reading from left to right: Mr Rusck (Sweden), Mr Gaspard (France), Mr R. A. Schmidt, President (Swiss), Mr Louvel (French Minister for Industry), Mr J. Tribot Laspière, Mr Ernest Mercier (France), Mr Saulgeot, Mr Montanes (Spain), Mr Borgquist (Sweden), Mr Silva (Italy), Mr Bakker (Netherlands)

Dr R. A. Schmidt, general manager of Société d'Energie Electrique de l'Ouest Suisse, President, welcomed the Minister saying that as the one in charge of the problems of production and distribution of electrical energy in France, the Minister was more aware than anyone of the ever-changing problems involved in the necessity of providing a country with a fully reliable and efficient public service. All CIGRE members would be deeply grateful to the Minister for coming.

It did seem that CIGRE had an "attractive" power. In 1946 the membership was 800. Now it had almost doubled and was nearly 1,500. Unfortunately, neither the premises nor the facilities had grown in like proportions and it was regrettable that there had been some shortage of sets of papers. This year, some 127 different papers were to be presented. Each represented a great amount of work on the part of the authors, which could not always be recognised. The Study Committees had become of the greatest importance and now constituted the foundations of CIGRE's activity.

Alternators

On the following day, 13th May, the basic work of the Conference began. Of the three subjects which were scheduled for discussion, that of alternators was the most important, having both a morning and an afternoon session devoted to it.

For convenience the papers were separated into three groups, the first dealing with the theory of machine operation, the second with constructional problems and the last with excitation systems.

In group one, there was a single paper only (No. 130) by Mr Hamdi-Sepen of Turkey, in which the author attacked the accuracy of the Potier diagram, and the two-reaction theory of Blondel used to predict machine performance under saturated condition. This did not arouse much enthusiasm among the audience, Mr Belfils (France), the Chairman, being the only one, to comment. He thought that for most practical purposes, Blondel's diagram was the best to work with and considered that step-by-step methods were often preferable to the direct attack.

The second group, dealing with construction, however, proved of considerable interest. An important general paper here, by Mr Langlois-Berthelot (France), was one presented in the name of the transformer study committee on dielectric fatigue in insulating materials (No. 105). This dealt mainly with ionisation and absorption current measurements, and included some details of tests carried out on alternator windings. The subject was extended somewhat by Mr Leroy (France) who gave some further details of tests. From this point the question of insulation in general came to the fore, based largely on a paper by Messrs G. L. Moses and J. C. Botts (U.S.A.) (No. 136) on the use of synthetic resin impregnated mica insulation for large rotating machines. It appeared from this and from companion papers on stator winding insulation on large h-e generators in Canada (No. 111) by W. R. Way, and creep in stator insulation by K. Abegg, that trouble was being experienced due to differential expansion between copper and iron. This was, on long stators, causing insulation disruption and failure. After some comparisons between various insulation methods, Mr L. W. James (G.B.), expressed the view that stator bar insulation was not causing particular concern to the B.E.A., and in this he was supported by Mr W. N. C. Clinch (G.B.) who suggested that rotors gave more trouble and that hollow conductors might be an answer in that case.

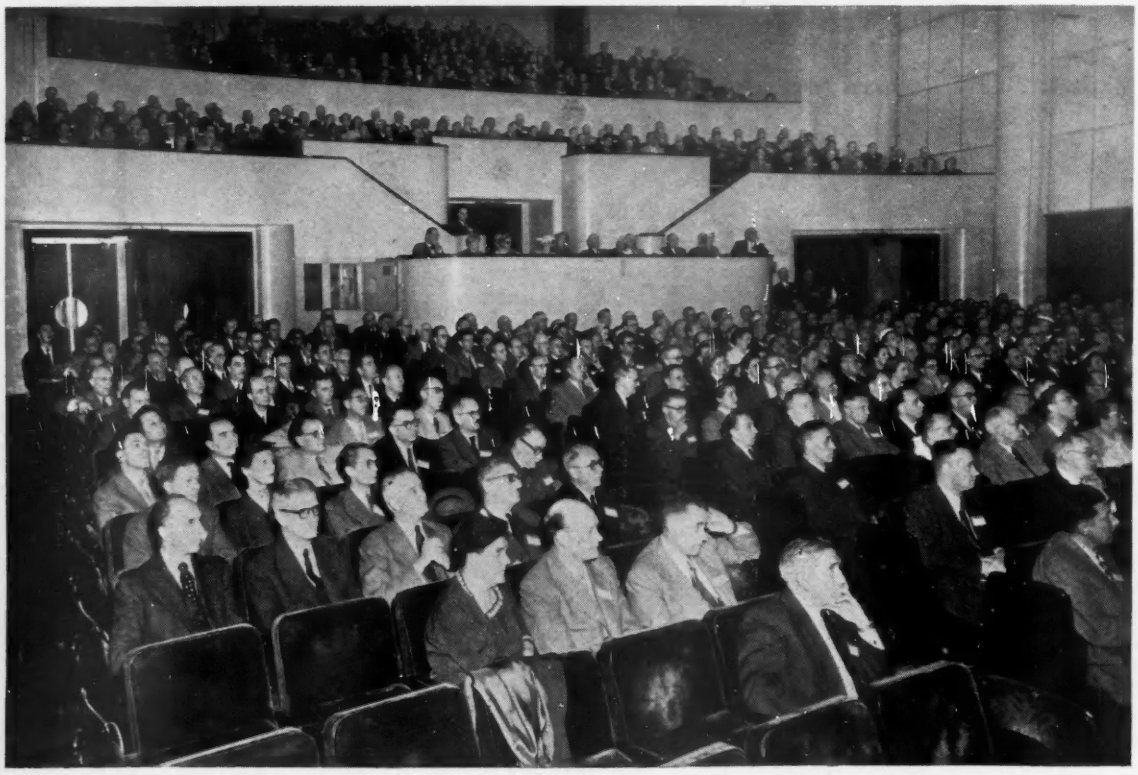
Following the luncheon break, the subject of copper temperature measurements came up and Mr Belfils (France) gave some test results on a synchronous condenser of 6 MVA. It appeared, however, from these that the existing rules fixing the temperature rises of machines should be revised after conclusions have been derived from a number of similar tests.

Large machine design then occupied the meeting, and it soon became obvious that the builders thought there should be no trouble, using modern techniques of cooling to attain, or even surpass, unit sizes of 350-375 MVA.

On the question of excitation, the main discussion developed on definitions. Several systems were, however, outlined and considered, particularly in paper 138 by Mr M. Vidmar (Yugoslavia) and (No. 147) R. David (France). In the latter a system was described whereby a change in rotor current, caused by a system disturbance, produced a transient current in the secondary winding of a transformer with a gap. This transient excited an auxiliary machine (the "impulse exciter") which was driven by an auxiliary motor and of which the armature was connected as a "booster-bucker" in series with the main exciter field. The flux of the impulse exciter was established without delay, because due to the linkage established by the air gap transformer, it was derived from the flux of the alternator itself. Thus a remarkably high speed response was available. The system could be used with any type of regulator, and had been installed in two French hydro stations.

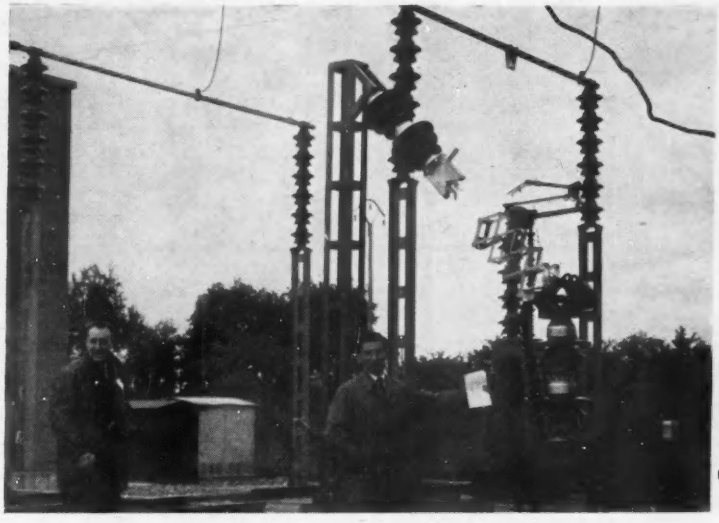
Finally, the chairman (Mr Belfils) gave a brief résumé of two Russian papers, submitted to the Conference the previous night. These dealt with hydro-electric generators in the U.S.S.R. and self-synchronising alternators.

A view of the delegates listening to the speeches being delivered at the opening ceremony of C.I.G.R.E.

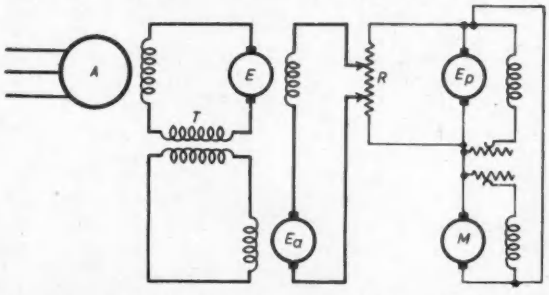


Substations

The arrangement of substations to produce an economical and efficient layout was responsible for much of the discussion in this meeting. Messrs G. Gaulet and J. Sallard (France) in paper No. 143 gave an account of the present trends as used in switching stations on the French network. There was a considerable variety of arrangements used, and, as Mr Alran (France) mentioned in the discussion, the E.D.F. is of the opinion that it would be most inadvisable to develop standardised layouts to a great degree. The question of pantograph type isolators was raised in several papers, one of the more important being an Italian contribution by Messrs A. Dalla Verde and R. Pedante. The main advantage of this type of construction is that only one insulator stack need be used. The paper itself concluded that the advantages of such types become more pronounced as voltage increases. The economics of the system, however, came into dispute. Mr Sviden (Sweden) maintaining that substations fitted with pantograph type isolators cost somewhat more than standard types. That this type of isolator could give satisfactory performance was, however, demonstrated by Mr Reiske (Germany) who showed several slides of existing installations in Germany. On the question of switchgear, Mr Lisle (G.B.) did not believe that metal-clad switchgear showed any advantage for voltages over 33 kV.



An isolator using a "lazy-tongs" system for moderate voltages



Arrangement for excitation by spontaneous impulse. A, alternator; E, main exciter; Ep, pilot exciter; Ea, pilot impulse exciter; T, impulse transformer; R, regulator rheostat

Control room layout both for substations and for power stations was also included, one of the significant papers being by Messrs E. Mean and P. Bavay (Belgium), Mr Nott (G.B.) in the discussion gave some general recommendations concerning the construction of control rooms, and Mr Donkin (G.B.) recommended that control boards for the generating side of power stations should be separated from those used in the switching and distribution systems.

Finally, comment was made on the paper by Mr W. Szwander (G.B.) which laid down proposals for the standardising of symbols and of electrical diagrams for substation work and Mr Sviden (Sweden) hoped that this matter would be taken up by the I.E.C.

Circuit-Breakers

Principal subject on the third day was that of circuit-breakers. The papers submitted this year were unusually academic and comparatively little information was available on the more practical problems of the design and operation of high-voltage equipment. Many of the contributions dealt with the significance and avoidance of switching overvoltages. As Mr McNeill (G.B.) pointed out in opening the discussion, this was a subject which had become popular over the past few years. There was a tendency on the part of some people to think that switching overvoltages were a function of the circuit-breakers themselves. It had, however, been established by the investigations reported in the papers, that the value of the overvoltage was dependent not only on the circuit-breaker, but also on the network characteristics and the type of breaker. He doubted if the suggestion to establish a limiting value of overvoltage was practicable. In most cases, protection could be ensured by the adoption of lightning protection techniques.

Mr Cherry (G.B.), however, said that switching overvoltages were of interest where the lightning occurrence was low. Lines had then to be designed to take these overvoltages into account. Limitation was practicable with resistors, and experience had been satisfactory except with the non-linear type, which, he thought, should be investigated for thermal capacity. It might be impossible to frame a universal test, but there was no reason why an arbitrary form could not be devised, although even this might be difficult if capacity currents were to be considered. Mr Baron (France) thought that voltages could be fixed for breakdown values, and that network conditions were becoming more understood.

Mr Meyer (France) emphasised the fact that providing conditions were known there was no difficulty in making a breaker which would operate satisfactorily. The trouble was that most breakers had to operate under a variety of network conditions, and had thus to be a compromise.

Magnetising current phenomena also occupied the meeting for some time. Mr L. Csuros (G.B.) pointed out that magnetising current was not a linear function. If the magnetising current was "chopped" the resultant wave would have a tail and would not be sinuosoidal. The resultant voltages could lead to restriking of the arc in the breaker. Oil breakers were particularly vulnerable in this respect. The conclusions drawn from artificial test conditions, might not, he thought, be representative of the practical service conditions, and such conclusions should, therefore, be accepted with some caution.

Testing Circuit-Breakers

One of the papers on testing circuit-breakers by J. Biermanns (Germany) (No. 102) detailed the Weil method of synthetic testing, whereby a superimposed voltage is developed in a resonant circuit at about 500 c/s, and this is applied to the breaker at the same instant as the main current from the testing alternator. By this means the breaker could be tested under the equivalent of full load conditions. Some doubt was cast upon this theory, however, by Mr Teszner (France) who thought that the test would not disclose a bad breaker.

The Reyrolle testing station came under some fire from both Continental and British Engineers. Dr Maass (G.B.), for example, while admitting that the "U" connection (See ELECTRICAL TIMES issue of 1st April, 1954) was useful for single-phase testing as single-phase transformers could be used, thought that it held no particular advantage otherwise, and as shown required a two-winding generator. It could, however, be used with a single-winding machine. In his view, although synthetic tests had to be used for large testing, the only logical way was field testing. Mr A. M. Cassie (G.B.) criticised a number of detailed points in several papers, particularly those dealing with arc phenomena, and Mr Leyburn (G.B.) ably defended the testing station by pointing out that it was designed to carry out both single and three-phase tests, that it was quite practicable to parallel all three alternators—a point on which some argument had arisen—and that the method of connection to the switchgear could not affect the total power available to any degree, as this power was a function of the rotational and magnetic energy stored up in the machines.

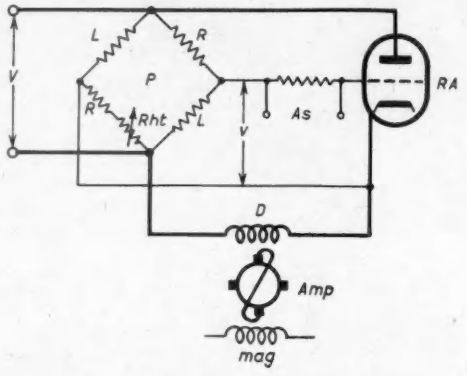
The discussion then developed into a fundamental investigation into arc phenomena, and covered such factors as post-arc conductivity, and current density and field strength of the arc at nominal current zero. Near the end of the day, Dr Mortlock (G.B.) expressed the view that testing stations at the moment, were really not capable of carrying out tests which would simulate the actual circumstances liable to be met in the field.

Insulators

The maintenance of insulator strings occupied a considerable portion of the time devoted to the discussion of insulators in general. Opinion was divided on the efficacy of silicone coated insulators, Dr Forrest (G.B.) maintaining that in his experience the efficacy of the silicone layer showed deterioration after a few weeks. This was contested by Mr Halstrom (Denmark) who recorded most satisfactory performance of treated insulators after even a year's service. In this he was supported by Mr Petit (France) who stated that silicone-coated insulators on communication lines had been found to be in perfect condition even after seven years' operation. It was concluded from these diverse reports that at the present state of knowledge it was difficult to draw any definite conclusions and only a longer period of observation would permit any definite assessment to be made of the value of this type of water-repellant protection.

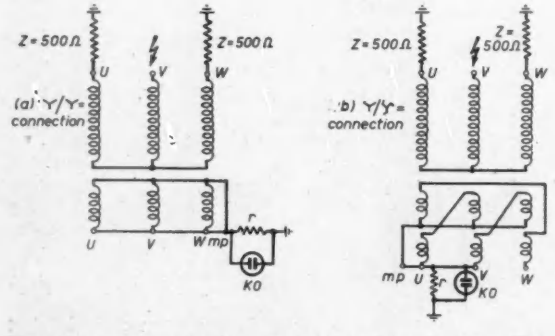
Dr Forrest (G.B.) also detailed the present British practice in the live-washing of insulators. The minimum resistivity of the water to be used, should not be less than 2,000 ohms/cm², the height of the water jet should exceed 22 ft from nozzle to insulator, and the nozzle itself should be well earthed. Washing periodically naturally depended on environment, but generally needed to be fairly frequent, rising even to once a day in areas with a particularly high level of pollution.

Mr Josse reported some results of laboratory tests in which insulators were sprayed, not with pure water, but with a solution of a conducting salt. By this means figures could be obtained which approached more closely the actual operating conditions.



Electronic method of controlling excitation. P, measuring bridge; L, non-linear resistance; R, linear resistance; Rht, voltage adjusting rheostat; As, servo-circuit; RA, electronic rectifier amplifier; Amp, amplidyne; D, de-magnetising winding; V, voltage to be regulated; v, grid polarisation voltage

On the question of radio interference, Mr Martin (G.B.) showed that the interference arising from insulators decreased toward the higher frequencies. Thus, there appeared to be less interference with television receivers than there was with radio receivers.



These circuits came under discussion in the transformer section. They represent a method for recording the charging current from the l.v. winding during impulse tests on the h.v. winding. K.O. is of course the oscillograph

Transformers

In the transformer field, by far the greatest amount of interest was provoked by the problems of impulse testing and surges. Mr Langlois-Berthelot (France), the special reporter, in commenting on this subject suggested that, apart from direct lightning strokes on lines, it was unlikely that transformers in practice would have to stand up to impulses as severe as those provided by the 1/50 impulse test wave. The question of obtaining consistent test results with chopped wave testings was dealt with by Mr J. E. L. Robinson (G.B.), who showed some slides to indicate the accuracy of successive tests. He suggested that the current waveform showed failure while the voltage waveforms did not. Mr Norris (Chairman) (G.B.) intervened to say that impulse testing had now reached a point where the chief engineer or chief tester could tell if a transformer had

been damaged, and could locate the approximate position of damage. Now we needed to go further and produce a specification.

Considerable interest was aroused by the paper by R. Elsner (Germany) (No. 101) which detailed a fault detection method using the close capacitative coupling between h.v. and l.v. windings, the characteristic of the charging current flowing from the l.v. winding to earth being measured across a small ohmic resistance. Mr Rippon (G.B.) thought it formed a most useful contribution to the art. He also commented on Mr P. G. Provoost's paper (No. 115) which detailed a method whereby chopped wave failures in transformer windings could be detected with the aid of an auxiliary full wave on one of the other h.v. windings. Mr Preston (G.B.) also approved of Mr Elsner's method. The meeting was, however, somewhat shaken, when Mr Cuffe (Ireland), speaking on behalf of the user, asked if it was generally realised how many impulse tests gave nebulous and unsatisfactory results He gave a list of unsatisfactory tests which had been carried out by research laboratories both in England and on the Continent and suggested that if impulse testing were to be useful it would need to be considerably improved.

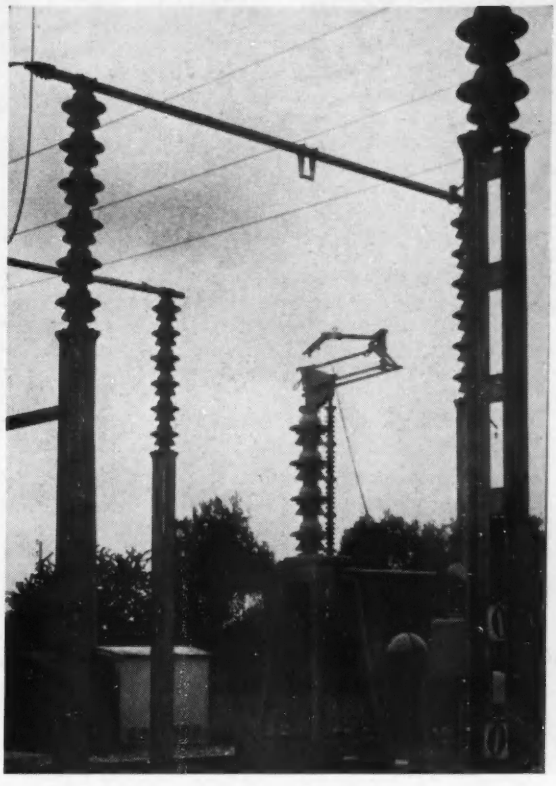
Dr Allibone emphasised that the trouble with chopped wave testing lay in the indeterminacy of the breakdown of the rod gap. Despite Mr Robinson's nice pictures, it was not an accurate job. Sphere gaps had been suggested, and he had developed a triggered sphere gap circuit which could be tripped with an accuracy of 3-4% over a time interval of longer than 50 microsecs. By this means it was possible to obtain consistent successive results.

Two papers (Nos. 123 and 124) the first by Mr M Wellauer (Swiss), and the second by Messrs C. Rossier and J. Froidevaux (Swiss), considered the effect of surges passing through large auto-transformers coupling networks of different voltages. Paper No. 124 stated that auto-transformers could give rise to secondary voltage oscillations of an amplitude greater than that of the incident surge. Mr A. T. Chadwick (G.B.) rose to the defence. By proper design, he said, a very nearly equal voltage distribution could be obtained on the windings. A complete series of tests, including impulse tests had been made on a 275/132 kV, 120 MVA, three-phase auto-transformer, and the results had shown that the impulse was transferred with an amplitude proportional to the turns ratio. The allegation that auto-transformers necessarily transferred excessive impulse voltages should be killed.

Mr Stenkvist (Sweden) also spoke in favour of auto-transformers. Although high voltages might be transferred on open-circuit, it was seldom that transformers were left unconnected to a network—and even if that were so, lightning protection could come into operation. The Swedish network already used large auto-transformer banks interconnecting the 380-220 kV networks, and were putting into service some 500 MVA 380/130 kV banks. The conclusions arrived at by Mr Rossier were misleading and he suggested that had the same measurements been made on separate-winding transformers Mr Rossier would have got the same results as for auto-transformers. This had been proved by tests carried out in Sweden.

Mr Heller (Czechslovakia) maintained there was no need for protection of transformers if they had been correctly made. If arresters were provided and flashed over during a surge, the effect on the transformer windings was equivalent to that of a chopped wave and was just as serious as the surge.

The latter part of the meeting concerned itself mainly with tap-changer, ionisation effects and more general questions.



Another type of pantograph isolator under test at Fontenay

E.H.V. Transmission

The growth of e.h.v. systems is mirrored in C.I.G.R.E. proceedings and as the chairman, Mr P. Sporn, said in his introduction, we are not a bit too early in electrical development to face the problems of today. Two e.h.v. systems were described in papers, the British 275 kV grid and American Gas and Electric 330 kV system. One of the first points to arise in discussion was the use of bundled conductors. Although single conductors are used on voltages over 200 kV in Japan and the U.S., the majority of schemes use two and in the case of German 380/400 kV lines, four conductors per phase. Mr H. M. Sayers pointed out that while single conductors could have been satisfactory on 275 kV, double conductors would in any case be necessary on higher voltage. The bundled conductors have a lower reactance which is advantageous on long lines and can be as much as 25% lower according to Mr Cahen (France). On the British grid where it is the practice to restrict rupturing capacity values Mr A. Chorlton (G.B.) pointed out it is necessary to increase the reactance of transformers. Mr Rusck (Sweden) reported most favourably on the operating experience of the Swedish 380 kV lines.

The question of corona was discussed at some length and originated largely from a paper on work carried out at a Japanese testing station. Mr G. Jancke (Sweden) referrring to the Swedish lines said that a loss of 2 kW per km had been expected from design considerations. Actual measurement, however, showed that much higher values were obtained in service and under the worst conditions might rise as high as 25 kW per km. The average loss was about 5 kW per km but this had occasioned no trouble. There was some general discussion on factors

affecting corona which added little to basic knowledge. Mr Popkof (U.S.S.R.) in referring to experimental work in connection with a proposed 400 kV line suggested that as corona depended so much on rain and other unfavourable conditions, designers should take into consideration the average rainfall of the area concerned.

The widespread nature of this subject led the discussion into a number of byways which were, perhaps, more relevant to other sections. This summary would not be complete without reference to the Ohio Valley project described in a paper by Messrs P. Sporn and V. M. Marquis (U.S.). This scheme was designed to meet a demand of the Atomic Energy Commission for its gaseous diffusion plant amounting to 1,800 MW and $15{,}000 \times 10^6$ kWh per year. This is surely the largest single power contract and requires the construction of two new power stations and an associated 330 kV transmission scheme.

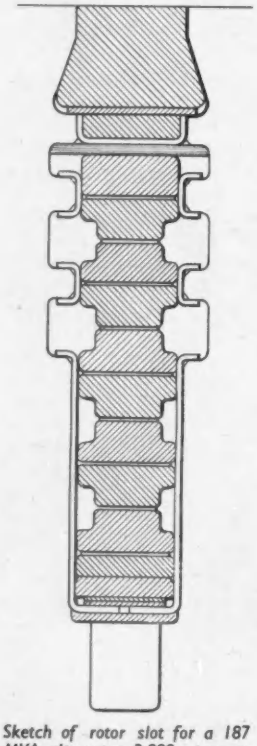
At the conclusion of the session a colour film of the erection of the British 275 kV lines was shown by Mr R. C. Brown.

High Tension Cables

By far the greater part of the discussion on cables was devoted to one paper (No. 217) by Mr L. Domenach (France). This paper dealt with the design of cables in the voltage range 220 to 400 kV and its main feature was the introduction of thin paper insulation under pressure, the use of a suitable screen on the conductors and the reduction of the thickness of oil or gas in the interstices between the layers of paper. Another feature, dealt with in the paper was the use of a polyethylene sheath within the cable to transmit pressure from the oil or gas to the conductor.

The paper included a survey of possible types of cable for voltages in the range of 220 to 400 kV including "pipe-type" cables in which the conductors consist of gas-pressure cables drawn into steel tubes which are in turn gas filled.

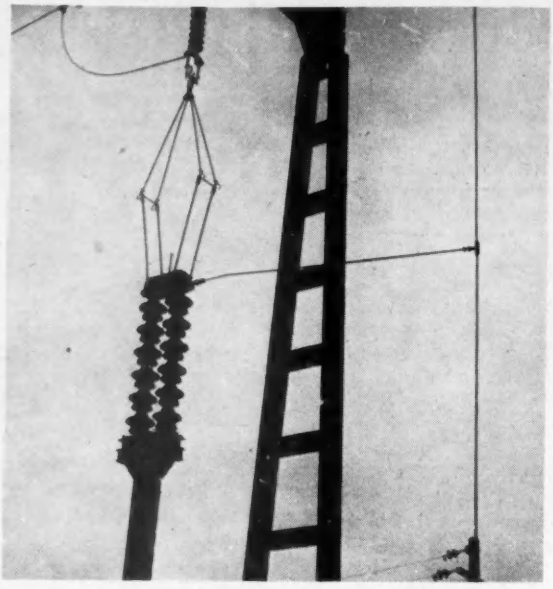
First speaker in the discussion, was, in fact, Mr Domenach himself. The semiconducting screen, he said, could be a layer of paper carbonised on one side only, to reduce thickness. An improvement of the order of 40% was possible with thin papers and this method. Comments had been made on the instability of polyethylene but in his experience, it stabilised after a short time.



Sketch of rotor slot for a 187 MVA alternator 3,000 r.p.m. to show cooling spaces

Mr D. T. Hollingsworth (G.B.) who had presented a paper (No. 212) on the use of aluminium as a sheath material gave a brief résumé of the present situation emphasising, however, the necessity for taking precautions against corrosion. Mr C. C. Barnes (G.B.) asked Mr Domenach for more detail of protective coatings used in the cables described in his paper. He also pointed out that great care was necessary, both in the manufacture and in the laying of cables with these extra-thin papers, and that this was a possible disadvantage.

Semi - conducting papers, using carbon black had been used for a long time in Italy, said Mr Gazzana-Priaroggia, and Mr Wyatt gave some details of American experience with polyethylene sheathed cable in America. After some years of use, it had been shown that the polyethylene sheath had the same tensile and mechanical strength as when it was new. He also commented adversely on the practice of wiping joints with aluminium sheathed cables. In his view the only way was hot or cold welding. Mr Hollingsworth, continued Mr Wyatt, had said that it was advisable to use aluminium tubes extruded from a single billet in order to avoid the possibility of flaws in the metal. This was uneconomic as it restricted the length of each cable section, and modern techniques made the use of continuous tube extrusion a perfectly sound proposition. Another American representative Mr Komives, commented on the pipe-type cable. On the question of aluminium sheathing he was glad to see that Mr Hollingsworth had mentioned the development of a mechanical joint.



Pantograph isolator closed to show system of connection to busbar

The session then dealt with problems of termination and the necessity for developing better sealing ends. For high voltages, Mr Banks (G.B.) thought that if smaller porcelains were to be used, the condenser cone system would have to be used. In this view he was supported by Mr Domenach who quoted experience with the Swedish system at Harspranget and French tests at Fontenay. Mr Morgan (G.B.) asked for more testing to be done on condenser-type end-bushings, particularly to establish the effects of pollution, and also mentioned the economic factors involved in the handling of large porcelains.

Finally, questions of mechanical strength and operational experience came up for discussion. Mr G. Bertaux (France) had presented a paper (No. 220) detailing a process whereby single-phase cable lengths could be jointed flexibly without increasing the thickness. This allowed a continuous armouring and lead sheathing to be used, and permitted lengths to go to several kilometres. The principal application for this cable is for submarine work. Mr Davey (G.B.) doubted if it was justified to have a mechanical strength reduction in the joints to 60% of that of the main cable. Mr Gossland (G.B.), answering a question raised in the Special Report, thought that the short-circuit capacity of cables was limited, especially in jointing points by the mechanical expansion of the conductor.

READERS' VIEWS

Correspondents writing under a pseudonym are asked to submit their names in confidence to the Editor

Unearthed Neutrals

I AM indebted to your correspondents Gamma and S. Arnold for their views on the above subject. Like Gamma, in spite of warnings about transient overvoltages I have never experienced any trouble from this source. I should have mentioned that the lighting system is fed from a 400/380 V "transformer." A great opportunity was lost in not installing a 110 V mid-point earthed system. It seems that 20 years ago people were not so "shock" conscious as nowadays.

S. Arnold's suggestion of tying the neutral to earth via a resistance is attractive but there are two snags in this case. One being the fact that in practically all the motor protective switches only 2 phases have overload releases. The other snag being the bonding system as installed caters only for leakage currents. To change over to earthed neutral would be a slow and costly business with no apparent advantage to be gained. It seems a clear case of leave well enough alone.

B. C.,
EIRE.

Wales Wants Autonomy

COMMENTING upon the present Welsh demand for a "T.V.A." the statement appears that Tennessee is more of a *geographical* entity than Wales. This is contrary to fact. The notion that the Tennessee watershed is a significant unit for anything but drainage was disposed of when the U.S. National Resources Committee declared it "almost absurd to take a river basin as a fundamental regional basis," which body also went on to point out that neither in theory nor in practice does the T.V.A. Act set the sphere of the Authority at the watershed boundary. Retailing electricity is, of course, on no kind of regional basis, being the responsibility not of T.V.A. but of 96 municipal undertakings and 50 rural undertakings.

The idea of a "T.V.A." for Wales is not of recent growth —the Government-appointed Welsh Advisory Council drew attention to the need for T.V.A. methods. Nor does it appertain to one party for its eventual evolution was proclaimed in the 1945 General Election Manifesto of the Socialist Party in Wales with its reference to "a Planning Authority for Wales on T.V.A. lines."

The recognition of the similarity of problems in Wales and Tennessee is not confined to the Principality. It has been recognised, too, by past and present members of T.V.A. who have studied the matter and by those who have visited Wales. Not only has this point been widely accepted in Wales—the ELECTRICAL TIMES once referred to T.V.A. as a household word in Wales—but significant comment comes from America. For instance, the wife of the man responsible for T.V.A.—Mrs Roosevelt—refers to the Welsh conception as a sensible one, while among financial experts, the Chairman of the Export Import Bank of Washington, calls it "an entirely logical idea." The matter has been well and minutely considered; there is nothing of the set-up hastily concocted to comply with the turns of political fortune.

That flooding and dust-bowls do not exist in Wales is irrelevant, for the *development* features of T.V.A., which it is intended to adopt, were independent of these calamities and are continuing with spectacular success after flooding and dust-bowls have been curbed. It is these developmental activities which are largely responsible for raising the *per capita* of the Valley from 40% of U.S. level to 60%. It has been pointed out that the people of the Valley had 898 million dollars more to spend than if their incomes had remained at the 40% level. As the cost of these developmental activities works out at approximately 2s. per annum per head of Valley population—the price of a dozen cigarettes—there is little room for hanging the epithet of milch cow, especially as the cost is dwarfed by the great rise in public revenues, including electricity revenues.

If subsidy is to be avoided in furnishing amenities to difficult areas, a way must be found, just as T.V.A. has found it, to suggest, stimulate and assist the introduction of income producing activities which will pay for and sustain these amenities. While electrical power is essential to increase economic activity, it is equally true that economical distribution can be greatly facilitated by expanding economic activity, which of necessity is tied up with expanding demand for electricity. It is not only in the rural areas of Tennessee, but in its urban areas too, that the stimulation of economic activity has gone hand in hand with increased public and private incomes and with swelling sales of units.

Some confusion may exist with the Council of Wales's proposal that the proposed Economic Development Corporation should, among other things, have at its disposal large grants for such things as farm roads. This is quite a separate issue, which the Government has considered but not yet accepted. This issue which is more in line with the generally accepted belief that there is need for more expenditure on roads, has no parallel in the T.V.A. methods. A T.V.A. comment upon the Council's report indicates that such action as a financing catalyst is foreign to T.V.A.'s programme.

One might refer to T.V.A.'s developmental activities as the use of know-how to provide opportunity. Opportunity may be present and recognised, it may be seen but not seized for lack of appropriate experiences, or it may fall into the category of opportunity which can only follow newly produced but related activity. It is in this field of stimulating new ideas for income production and, through the provision of know-how, helping to translate ideas into reality, that T.V.A. excels. Through such means, and not through subsidies, can brawn and brain find its most fecund outlet in Wales as in Tennessee.

C. F. Matthews,
NEWBURY, BERKS.

Temperature Controlled Clocks

I HESITATED in writing to you before as I thought you would have had a voluminous reply concerning temperature controlled clocks mentioned in your issue of 13th May.

The extraordinary condition mentioned by your correspondent "J.R." where skirting plugs were controlled by a thermostat is very, very unusual.

However, the matter is more and more unique, insomuch as the clock purchased was a self-starting unit. There is no doubt that 99·9% of the clocks sold are not self-starting, and therefore, the chance of putting a self-starting clock on the temperature control circuit is one of those chances that are more unique.

F. P. Sexton,
A.R.C.S., A.M.I.E.E.

around the trade

by Peregrin

I CLAIM to know something about electrical retailing, but I had a surprise recently, two in fact and both of them pleasant. I was with a well-known dealer in his show room, right in the heart of the Black Country, if that austere locality owns such a tender thing as a heart. A lady, a regular customer, came in and asked for a time switch. That was the first surprise. The second one followed immediately for my friend produced a time switch as easily as if a 60 W lamp had been demanded, and as unconcernedly. After the customer had gone, leaving instructions for the switch to be delivered and installed, I learned that this was not an unusual inquiry. The time switch is now used for more purposes than operating street lamps and shop window lights. It can help to deceive burglars by lighting a deserted house when darkness approaches, it can launch a small cooker on its task of heating the evening meal ready for the arrival of the absent diner, or a convector to heat the breakfast room while the housewife stays a little longer in bed. It is not expensive, quite presentable, easy to install, bears no tiresome purchase tax, and usually produces a wiring job for the retailer.

There is one small snag. Time switches are not too easily adjusted by the inexperienced. The type in which the whole movement may be withdrawn from the case ensures safety and avoids fumbling in the dark, but the array of figures and levers is rather alarming, while the 24-hour dial is a snare which may easily lead to all kinds of inconvenient switchings on and off. There is a ready domestic market for a simple, easily installed and easily reset time switch.

Paint and Pressing

There seems to be no task beyond the versatile slave who works for all of us and for whom some of us are privileged to work. At least two electrical paint removers are now available, which, with a consumption of well under a kilowatt, involve less skill and less danger than the traditional blow-lamp method, but with equal efficiency. This is a long-awaited device and it would ill become me to criticise it, or indeed any other electrical aid, but does the eager purchaser always realise that an appliance which inevitably has to be used sometimes in remote positions is tied to a trailing flex that it cannot elude. Other very useful gadgets are similarly afflicted. The electric lawn mower and hedge clipper are blessings to the not very energetic gardener, but when the scene of activity is fifty or more yards away, that inexorable flex becomes a problem. It is not so bad while the operator is travelling away from the source of supply. The flex then trails docilely behind, but on the return journey it is apt to be a lively and unpredictable reptile, coiling itself round the machine and the user and everything else, while persistently attempting to destroy itself in a shower of sparks, among the blades of the machine.

The electric steam iron has made a rapid impact on the domestic market and it is rapidly developing from a novelty to a commonplace. The housewife who not so long ago viewed it with sceptical indulgence now covets one and means to have one. Many well-known manufacturers have entered this field, and one recent introduction costs not much more than the high-class automatic type.

Americans have had a choice of steam irons for some time, and illustrations depict some very glossy and complicated looking contrivances, with an alarming array of controls. All the same the English models are beautifully made, and from all accounts they are just as efficient and reliable as they look. With one outstanding exception these new irons are available through usual trade channels, and wholesalers are doing good business with them.

What is the service aspect of the steam iron, or is it too soon to answer that? Like the popular heat-controlled iron it will have one good effect, in cramping the style of the handyman. Repairs and replacements will be a job for the electrical serviceman, as should be all electrical repairs, and the do-it-yourself addict is unlikely to try his hand even if he can obtain the necessary spares. Repairing the old-fashioned type of electric iron is far too easy; even the housewife, whose iron fails during the ironing, pops down to the local electrical shop, buys a new element and fits it.

Water Heating

This promises to be a good season for water heater sales. Now that restrictions on the use of electricity are virtually ended, and purchase tax reduced, contractors may confidently continue their efforts to meet a demand that never seems to lessen. Manufacturers now have adequate stocks, and more than adequate variety. In fact the choice of water-heating equipment is bewildering, and the wise contractor will not confine his attention to the immersion heater, which after all is very much of a compromise, though a good one.

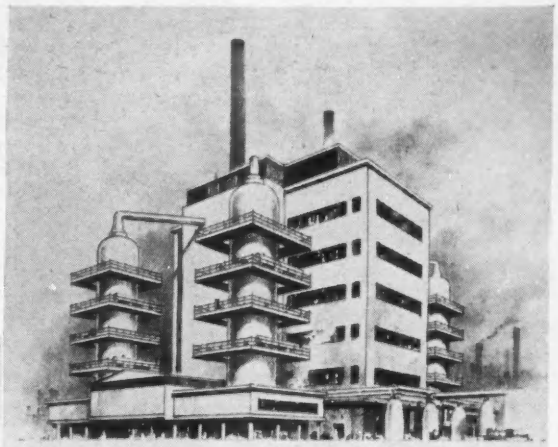
There is a very wide range of storage and instantaneous heaters, and the two combined, designed for an equally wide range of applications, from the bar and canteen heater to the tiny cylinder hidden beneath the kitchen sink. Loadings are remarkably low, with consequent economy, while appearance has not been neglected. Indeed the modern storage heater in pastel shades, is quite comely compared with its obese and invariably white or copper ancestors.

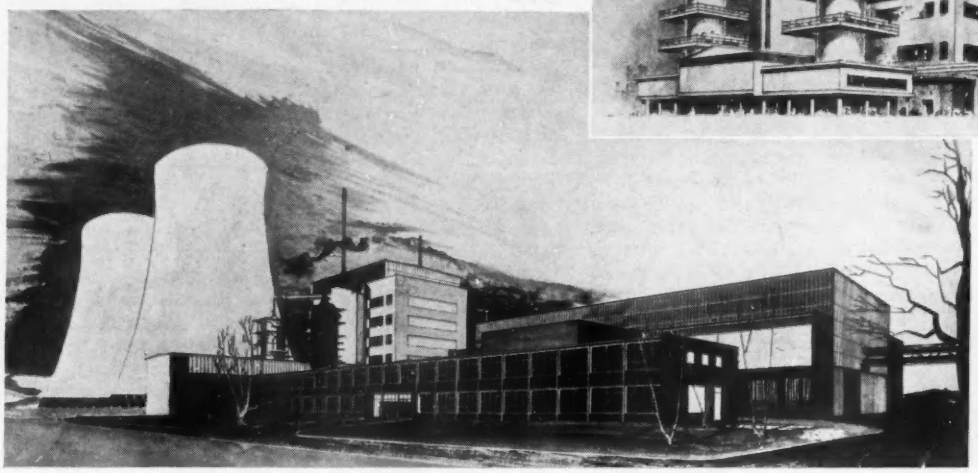
A notable feature of the water-heater trade is the service offered by the big wholesalers. The contractor with little experience beyond immersion heaters need not fear to extend his scope. He will find at his wholesalers not only a comprehensive display of most makes and types, but someone competent to explain and demonstrate their various uses. Pressure, non-pressure, cistern, dual-purpose, continuous flow and the rest. They will all be there and there is no mystery about them.

Of course the cheap and trusty immersion heater is not to be despised, especially if assisted by the almost essential lagging jacket, and there are still many thousands of domestic water tanks waiting for one. But water heating in its many forms has enormous scope, and it can provide a profitable and interesting line of business for those who go out to seek it.

Steam Raising from the Atom

CALDER HALL HEAT EXCHANGERS





PICTURES BY COURTESY DEPARTMENT OF ATOMIC ENERGY

THE link, between the atomic piles and the turbines at Calder Hall atomic power station will consist of eight heat exchangers, incorporated in heavy steel shells some 80 ft high, which will transfer the heat from the hot gas (carbon dioxide under pressure) into superheated steam. The heat in the carbon dioxide is provided by the graphite-moderated uranium reactors, and the hot gases give up heat to the preheating, evaporating and superheating sections of the steam plant. The steam-raising towers are now in course of manufacture at the Renfrew works of Babcock and Wilcox Ltd.

In order to obtain maximum efficiency from the steam cycle, which has a comparatively low temperature, a double-pressure arrangement has been devised. Each tower contains, in effect, two separate sets of steam-raising equipment, there being separate h.p. and l.p. economiser, evaporator and superheater sections, each with its own drum and feed pump. The turbine plant will, in accordance with Sir Christopher Hinton's paper on "Nuclear Reactors and Power Production," be provided with an l.p. section which will receive live steam direct, as well as steam which has already passed through the h.p. section.

The heat transfer is in itself of vital importance and all heated surfaces are of stud-tube construction to provide the maximum surface area. The studs are flash-welded and have smooth surfaces and a profile giving good aerodynamic properties. An important requirement of the internal heating surfaces is that there should be no leakage of steam or water into the coolant gas, otherwise contamination of the internals of the reactor—the fuel elements and graphite—would result. The design, therefore, involves no joints inside the pressure shells except those which, once completed in the shops and exhaustively tested, will not be required to be broken throughout the anticipated life of the plant. In addition, the high pressure of the coolant gas (due to the need for economy in blower power) requires the whole system to be built to withstand this pressure without any possibility of leakage. It is not too much to say that the long experience of Babcock and Wilcox in the production of large fusion-welded pressure vessels to fulfil the most stringent requirements, has played a significant part in the development of this project.

Another interesting feature of the station is, of course, that it has no chimneys in the generally accepted sense, since there is no coal or oil being burned. Two comparatively small vent pipes are provided on each reactor house for extracting any heat loss from the reactor which is not transferred to the steam towers.

Though it has been suggested by Sir Christopher Hinton that, in the years to come, one might look back on this first Calder Hall plant with a critical eye as to its crudity, and while there is little that is orthodox about it, yet the closest possible approach to orthodoxy has been made in the design and construction of the steam plant—a decision which it is felt with confidence will cause no future regrets.

The part of the contract allocated to Babcock and Wilcox includes the complete steam towers and their associated feed pumps, etc. The reactors are being built by the Department of Atomic Energy, the pressure vessel, or outer shell for the reactor being made by Whessoe Ltd. The circulating gas blowers and pipework are by C. and A. Parsons and Co., Ltd., who are also supplying the turbo-alternator plant. The main contractors for the station building are Taylor Woodrow.

Top right is shown a nuclear reactor unit complete with heat exchangers and on the left of it is an artist's impression of the first section of the station with generating section

Illuminating Engineers at Southport

Subjects discussed at I.E.S. Summer Meeting range from plant irradiation to home lighting

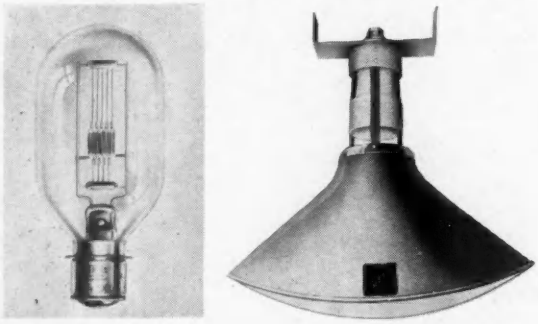
LAST week's Summer Meeting of the Illuminating Engineering Society was particularly notable for its all-round excellence, quite apart from the more specialised value of each paper individually. Its six technical sessions traversed the entire field of illuminating engineering, finding common meeting grounds with subjects as diverse as economy and botany or filament design and aesthetic standards. One of its common themes, however, was the tendency, now gaining momentum, of users' requirements, as interpreted by the lighting engineer, to influence design of light sources.

The theme was established right at the start in Dr J. N. Aldington's paper reviewing modern lamp design and usage. Particularly is it true in the tungsten filament lamp. In its diverse forms and flexibility of design, voltage range and light output, it is still the best source of light for a host of uses in most of which discharge lamps cannot even rank as competitors. Extra low voltage lamps rank as an important branch of the types available. Their chief advantage lies in a filament, which, being short and rigid, enables the lamp to be accurately positioned in an optical system, and being robust, ensures that the lamp will withstand reasonable shock. Moreover, the lower the designed voltage, the greater the filament wire diameter, resulting in higher efficiencies provided that end cooling effects are not predominant.

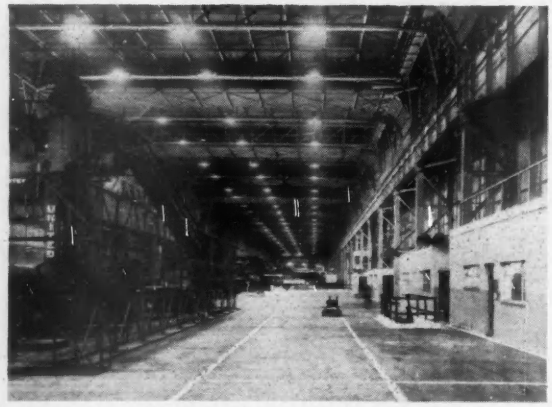
Pre-focus Lamp

An application of e.l.v. lamps which shows up its advantages in a favourable light is that of the double filament pre-focus bulb used in modern car headlamps. For another example may be taken the coiled coil filament, which gives an almost spherical light source eminently suited for use in spotlamps, small searchlights and the like. Projector lamps also provide a good illustration of the tungsten filaments versatility. Made in extra low, 110/115 and 200 to 250 voltage sizes, their development parallels that of the lamp-maker's art. The earliest design of a continuous filament coil progressed through the stage of the series of parallel segments aligned in a single plane to the modern, bi-plane filament which, whilst remaining rigid at a temperature of 3,000° K, has its component parts separated by a mere millimetre or so.

Gas discharge lamps, among the earliest electric lamps, focus attention to the discharge itself. Higher luminous efficiencies were obtained by utilising much higher gas pressures than those normally used in h.v. cold cathode lamps, especially with rare gases of high molecular weight. Xenon is used in most h.p. gas-discharge lamps, whether of the intermittent type (used for photography) or the continuously burning type. When considering metal vapour lamps, one of the greatest difficulties overcome in mercury vapour lamps was that of arranging conditions to ensure that the resonant radiation in the ultra-violet region was absorbed and re-emitted as visible light. In the sodium lamp, the resonance radiation produced when the metal is excited lies conveniently in the visible spectrum. Distinguished from all other forms of discharge lamps, however, is the fluorescent lamp, by virtue of having found almost universal application for general lighting purposes. The two factors contributing most to its success are performance in lumen hours and excellent lighting distribution resulting from its linear form. Despite the difficulty of colour (due more often to intangible requirements of the user) the lamp has found use in almost every field except that of the home, a field which now offers a major challenge to the lighting engineer.



Projector lamp with pre-focus cap and bi-plane filament with, right, a reflector designed for use in plant irradiation



Lighting in the rolling mills of the Abbey Works is provided by the special blended lighting units seen here

Suburban Street-lighting

With the lifting of lighting restrictions at the end of the last war, street-lighting was soon to become a matter of major public importance. One of the many Local Authorities then faced with the task of providing efficient and modern street-lighting was the Harrow Urban District Council and the means by which they tackled the problem was described in the second paper, by Mr A. T. Durbridge. The area, a large suburb to the North-West of London, was originally lighted wholly by gas. As a first step, the Council called its neighbouring Authorities to conference to agree in principle on the standardisation of lighting for

the main traffic routes transversing their areas. Certain standards were finally agreed on road grouping and minimum lighting level. In the meantime four manufacturers had approached the Council asking for permission to install trial installations of six fluorescent lighting units. Four shopping centres were chosen and each equipped by the manufacturer.

In 1949, the Council approved a five-year plan for converting the whole of the district to electricity, recommending that fluorescent lighting should be used for all Group A roads and sodium lighting for Group B roads. However, due to severe restrictions in capital expenditure at the time, coupled with materials shortage, the Ministry of Transport allowed only a limited annual expenditure on street-lighting, and pointed out that fluorescent lighting would be approved only for principal shopping areas. In 1950, the first year's programme, estimated at £26,200 was approved, the plan providing for 116 fluorescent lanterns of the three-lamp type and 263, 140 W sodium lanterns of the totally enclosed type with acrylic refractor plates cemented to the inside of the bowl. By December 1953, some 1,305 lanterns were commissioned, the completed scheme having, eventually, some 10,000 lanterns.

By the appropriate use of artificial light, greater control over the growth and development of plants is possible, but as yet, this subject is still complex, as was indicated by the paper given by Mr A. E. Canham, M.SC.(ENG.), which discussed the effects of different light conditions.

Industrial and Domestic Lighting

The type of lighting adopted for any particular industrial building usually depends on a variety of factors, among which capital and operating costs, technical requirements and maintenance facilities form the most important. Four papers were presented on this subject to illustrate the advantages for particular applications, comprising two fluorescent high bay mercury lighting and blended light installations. Of the two fluorescent installations, that described by Mr S. T. Clark was hot cathode, for a weaving shed. The other, discussed by Mr W. Howe, A.M.I.E.E., was a cold cathode installation for a large engineering factory in which considerable precision work is carried out. Mr F. Jones discussed high bay mercury lighting installed in a crane shop whilst the blended light installation, described by Mr G. W. S. Levey, M.I.E.S., was that in the Abbey Works of the Steel Company of Wales. Each paper discusses the installation in its technical and economic aspects, giving experience of operation to date.

Commercial lighting, in its decorative aspects, was considered by Mr M. A. Claude, of Paris, whose basic theme was that initially the light scheme must be conceived by an artist from purely aesthetic considerations, regardless of the ultimate purpose of the installation.

Of the different fields of lighting, however, the domestic field has, during the years since the war, received the least attention, although the variety of modern designs of domestic lighting fittings now on the market indicates an increasing realisation of the arrears to be made good. For this reason alone, the closing paper of the meeting by Mr A. H. Young, M.I.E.S., and Mr C. J. Misselbrook, B.SC.(ENG.), M.I.E.S., was worth while, but the suggestions put forward for future developments, particularly in fluorescent lighting, make the paper especially valuable.

After reviewing the period from 1928-47, the latter part of which saw a complete stagnation in domestic fitting design, the authors trace the development of "contemporary" fittings from the "Britain Can Make It" exhibition. This event saw the introduction of the simple, spun metal reflector able to be turned through 360°, and having, as sole decoration a single ring of holes pierced in it. Then

Sodium lighting in Mawney Road, Romford, Essex

the "Festival of Britain," by showing many manufacturers that the majority of designs were behind the times, stimulated such mass action, that already, only three years later, pleas for a halt are being heard, so many fittings now being to a reasonable standard of design.

In planning domestic lighting installations, the modern trend of open planning in which rooms are used for more than one purpose makes the task of the lighting engineer difficult. Deciding the visual task to be lighted, eventually means providing varying intensities in different places at different times. It is seldom possible to rely on general lighting only, the answer being local or localised general lighting. In the past, however, the idea for house installations of one ceiling point and perhaps one lighting socket-outlet to a room was the only one the majority of local authorities could understand. Hence the householder aspiring to a more satisfactory lighting scheme found himself faced with extensions to the wiring system which were conducive to neither safety nor pleasing appearance.

When considering the use of fluorescent lighting in the home, a number of difficulties appear. It seems likely that, basically, there are five reasons why 99% of the homes do not use this medium, one of the greatest being the distortion of colour attendant on its use. As persons accept distortion under filament lighting by having grown accustomed to it, fluorescent lamps for home use must, therefore, have a similar colour appearance and colour rendering properties now realised in the "Deluxe Warm White" lamps. Another drawback lies in the delay, even with transformer starting, in striking after the lamp has been switched on.

Perhaps the greatest deterrent to the spread of domestic fluorescent lighting is its initial cost—whereas average householders are probably prepared to spend up to £5 on a fitting, they must pay £20 for a reasonable fluorescent fitting. Ways and means, therefore, must be found of reducing initial cost. Another obstacle to the adoption of fluorescent lighting is the present inadequacy of fittings design, although no doubt attractive fittings could be produced. Nothing larger, however, than the 3 ft lamp could be handled satisfactorily in most cases, the circular lamp here having distinct possibilities. Finally, two other factors, radio interference suppression and the reduction of circuit components to a minimum, have also to be considered. The ballast lamp circuit gives hope that these problems can be overcome, and if its principles can be extended to shorter lamps and costs reduced still further, then domestic fluorescent lighting may become a practical proposition.

MORE WAGE DEMANDS ?

Matters Raised at Annual Conference of the E.T.U.

THE need for further wage increases was once again a prominent feature in the discussions at the annual Policy Conference of the Electrical Trades Union which began at Margate on Monday. In addition to the wage awards to employees in the Contracting Industry announced earlier this year, comparable increases have been agreed for apprentices (see page 793), and an application has been made to the National Joint Industrial Council for the Electricity Supply Industry for an increase in the rates for all manual grades within that schedule.

In his presidential address to the conference on Monday, Mr Frank Foulkes, after referring to the Union's membership being now over 220,000, said that since its inception, the Electrical Trades Union had always been prepared to stay in the forefront of the political and industrial struggle.

Members' Loyalty

The demonstration of loyalty by their contracting members in carrying out a very difficult strategic fight against their employers, the support given to those members by the membership employed in other sections of the industry and by the membership of other unions, was a lesson in working-class solidarity that had increased his pride in being a member of the Electrical Trades Union and in being elected its general president, he added.

He was convinced that future wages increases, that a higher standard of living for those working, and those who because of age were no longer employed in industry, would only be obtained by the realisation by the employers of the determination of the workers to obtain that to which they were entitled.

Those who say that the employers cannot afford increases in wages, or those who say that we are pricing ourselves out of the world's markets, are guilty of calculated hypocrisy, he declared.

After Mr Foulkes' speech, rank and file delegates congratulated their executive council on the conclusions they had reached after the strike in the electrical contracting industry, and carried unanimously a resolution recording "the loyalty and fighting spirit of the membership," and pledging continued support for the wages policy. The resolution criticised the popular press which, it said, had printed slander and lies about the strike. In a statement to the conference the General Secretary, Mr Walter Stevens, outlining the conduct of the strike, maintained that the union used the established negotiating and conciliation machinery until forced by the employers to take strike action after all machinery for avoiding disputes had broken down.

The conference dealt with a number of questions concerning apprentice members. Full support was given to a demand for one day's technical training per week to be given to apprentices up to the age of 21. The executive was also asked to find a way of ensuring that apprentices employed by contracting firms who only did one type of work were able to acquire a full practical knowledge.

The conference called on the executive to seek a substantial increase in apprentices' wages particularly in the contracting industry where rates were far below those paid in building and electricity supply. Speaking for the Executive, Mr R. G. McLennan said the advances obtained from the N.F.E.A. were quite substantial. The original claim in November 1952 was for percentage rates ranging from 20% to 80% according to age. The agreement arrived at last week gave increases in the percentage rates for apprentices from 20% at 15 years of age to 70% at 20 years of age.

Delegates also endorsed a resolution calling on the executive to negotiate holidays with pay for six statutory holidays in all districts, and asked that when any holiday fell on Saturday or Sunday it should be permissible to transfer it to a working day. If that failed, said the resolution, the executive council should press for the application of the five day week in the contracting industry.

The executive council was asked to seek measures which would assist in obtaining speedier negotiating machinery within the industries where the union had either sole or joint negotiating rights. The resolution expressed the belief that all wage awards should be paid with effect from the date of application.

On Tuesday, during a debate on wages, prices and profits, Mr Walter Stevens, general secretary of the Union declared that after the conference, new wage claims would be initiated in all industries where the union's members were employed. Mr F. Haxell, on behalf of the Executive Council, proposed a resolution which was carried, reaffirming the Union's policy for the strengthening of the industrial machinery for collective bargaining, but declining support to proposals that arbitration should be the final stage of the negotiating machinery.

International Meeting ?

International matters usually figure prominently in the discussions, and this time there is a proposal that E.T.U. should endeavour to call an international conference of electrical workers' unions, the idea being that there could then be an exchange of information on such matters as wages and conditions in the electrical industries. Another matter for discussion is that of the registration of electricians, and the setting up of an independent inspection council. That has already been the subject of lengthy discussion between the National Federated Electrical Association and the E.T.U., as the report of the Union's Executive Council presented at the conference this week shows. In this it is stated that the views of the N.F.E.A. and the E.T.U. were closely associated, both agreeing that all voluntary schemes of inspection having failed, the inspection of electrical installation work must be subject to statutory control. It is also agreed that there should be qualified inspectors having statutory powers to decide whether or not an installation had been carried out in a safe and satisfactory manner. But the matter is still under discussion, we understand. The wage negotiations and the strikes which took place in the Contracting Industry some months ago are also dealt with at some length in the report. The strikes threw up another problem—that of the apprentices who were unable to work. The employers suggested a modification of the apprenticeship indenture with the object of relieving the employer of the obligation to pay wages to the apprentices during strike action. The N.F.E.A. suggested the Union should give an undertaking that in the event of an official strike, the apprentices would be entitled to strike pay even though they were not taking part in the strike. Such a procedure would not upset the legal position, they asserted. After further discussions, it was reported at a meeting of the N.J.I.C. that agreement had been reached to suitably adjust the deed of apprenticeship.

New Telephone Installation for the Shell Network

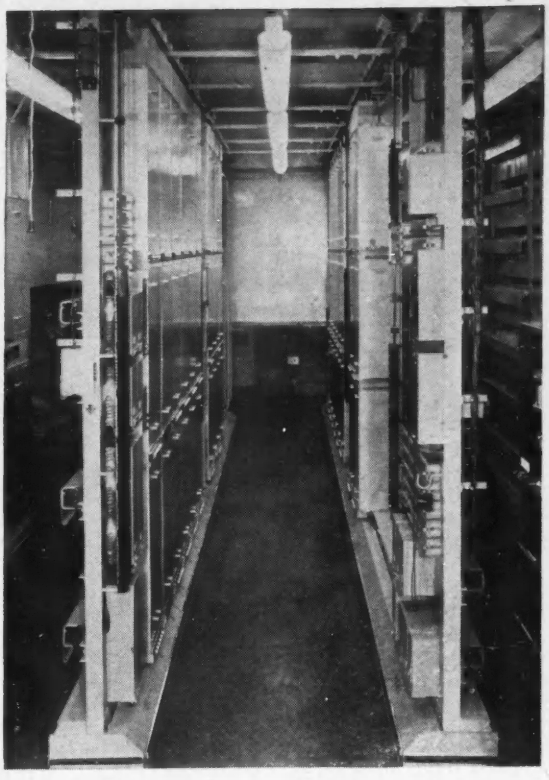
MODERN business organisation depends so much on communications that the efficiency and operation of an internal telephone system is nowadays taken for granted, whilst present-day advances in both technique and equipment often take the form of detailed improvements having little immediate impact on either the user or the general engineering worlds. When, however, several such advances are incorporated in a completely new installation, as in the case of the 1,200 line exchange put into service at the Shell Petroleum Company's headquarters this month, a general appraisal of developments in communication may be made. This new 17 P.A.X. equipment, designed and installed by Siemens Bros. and Co., Ltd., in co-operation with the Shell company's engineers, incorporates several new engineering features and is probably the first of its type in the world.

In the design of No. 17, the approach to the question of switches and switching arrangements broke away from convention, two new switches, motor uni-selector and digit switch, being the ultimate result. The motor switch comprises two main parts, mechanism and bank, of which the latter is semi-circular in construction and, in 16 arcs of 52 segments, has a total of 832 segments. In the mechanism, the motor, which rotates the wipers, is of unusual design. One of its two stator coils is energised, turning the solid rotor towards it and at a given position a cam-actuated interrupter transfers the energising current to the other coil thus producing a continuous rotation.

At a maximum rotor speed of 50 r.p.m. the gearing is such that each wiper moves over its arc at a rate of 200 segments/sec, thus reducing the delay in finding free outlets. At this speed stopping the wiper at the desired outlet requires auxiliary apparatus operating almost instantaneously, achieved by the use of a Siemens high-speed relay which operates in one millisecond. As the wipers reach the outlet, the relay opens the circuit controlling a magnetically-operated latch, which engages with the gear wheel to arrest movement.

The special digit switch, ratchet-driven to operate from impulses, is of advanced design. Of its two parts, the mechanism is completely replaceable without additional adjustment, thus facilitating maintenance. The switch has been designed to sweep its bank up to a million times without adjustment, and should this then be necessary it can be quickly effected from the panel front. The No. 17 P.A.X. is stated to be the only large switch system which does not require wiper cords for making connections to moving parts of switches.

Apart from its main function of providing fully automatic working between telephone instruments in the Shell headquarters, the exchange acts as the coupling medium for all telephone calls throughout the Shell network in London. Prefix digits route calls into head office, head office to or from any satellite, and inter-satellite circuits. Although this involves 1,200 lines at present, provision is made to increase this on the existing equipment to 2,000 lines, whilst space is available to extend the entire installation if necessary. It is of interest to note that this installation has led to the adoption of No. 17 equipment by the British P.O. as the basis for a new semi-automatic trunk system, and to a number of overseas contracts, notably in Canada and Australia.



View of linefinder and final automatic switching racks. As can be seen, all working apparatus is totally enclosed. The lighting equipment was supplied by an associated company

I.E.E. Concerned about Recruitment

PRINCIPAL theme of the report of the I.E.E. Council for 1953-1954 is the need for increasing recruitment. Though the growth of membership which has been apparent since the war was maintained, and though there has been an increase in the number of graduates, it is considered that the elections and transfers to this class are still not adequate to meet the country's needs for professionally qualified engineers. At 1st April, 1954, there were 30,269 corporate members and graduates on the register out of a total membership of 38,946.

The Institution remained active in all spheres of education during 1953-54, and a conference was held to facilitate an exchange of views on courses for electrical technicians and the steps to be taken to bring them into effect. A Joint Advisory Committee on Education has been established by the presidents of the three major engineering institutions, and has given much attention to the question of a new national award in technology.

The Report gives details of activities in many other technical fields, notable amongst them being the preparatory work now being carried out on a 13th edition of the I.E.E. Wiring Regulations.

N.C.B. NEEDS MORE ENGINEERS

BRITISH coal mines produced 212·5m tons of coal during 1953, about 1·8m tons less than in 1952, with seven fewer working days. Overall productivity was up to the 1951 level of 1·21 tons/manshift, though the face productivity, at 3·14 tons per manshift, was slightly down. Total costs at 59s. 2d. per ton were 2s. 6d. up on 1952 while the proceeds from the sale of coal were 3s. 11d. up on that year, and gave a profit of 1s. 11d. per ton, before charging interest. For opencast production, the average cost was 51s. 6d. per ton and the proceeds, 55s. 3d. per ton.

These are the leading statistics given in the National Coal Board's report and accounts for 1953, which were published last week. After allowing for interest and similar charges, there was a surplus of £0·4m on a turnover of £682m. During the year, the Board spent £64·3m on capital account, compared with £48·6m during 1952.

In considering the results of the year's working, the report emphasises the diversity of experience involved. At the beginning of the year there were 720,700 employees in the industry, but there was a net fall of 10,000 during the year, although the total number of face workers remained effectively unchanged at about 300,000.

It is considered by the N.C.B. that the annual capital expenditure on reconstruction is still too low, although it improved considerably during the year. One of the main obstacles to faster progress is the shortage of qualified planning staff. In particular, more civil, electrical and mechanical engineers are needed on the Board's own staff. It is considered that the speeding of the vital work of reconstruction will be one of the Board's main tasks for 1954.

In the course of an analysis of coal usage, the report acknowledges that electricity power stations, using 2¼% more coal than in 1952, sent out 6% more energy and effectively saved at least one million tons of coal by increased generating efficiency. Total coal used for electricity generation was 36·7m tons.

Technical Developments

Many of the technical developments that help improve the industry's efficiency have been noted when they were introduced. A summary of those of primary electrical interest may, however, be helpful. One is the development of Koepe winding, in which a single rope is driven by friction, as compared with the traditional British practice of reeling separate ropes for the two cages of skips on to a drum. This will need new electrical winding equipment techniques. Other new developments have overcome obstacles that previously hindered automatic a.c. winding. During 1953 the first large automatic a.c. winder incorporating speed load compensation and other features was installed at Lynemouth colliery in the Northern Division.

Developments in underground transport methods included "very satisfactory" results with a 90 h.p. battery locomotive, while in July the first experimental trolley locomotive in a British mine was put to work at Sandhole colliery in the North Western Division. On the surface, experiments are being conducted with the electrogyro locomotive, which has been described in these columns before.

Plant Engineers meet at Scarborough

FOR their annual conference, held at Scarborough last week, the Incorporated Plant Engineers adopted the effective discussion group system to give everyone something to talk about. After the Presidential address and another address by an important industrial engineer, the conference split up into groups to consider industrial accounting as a tool of management; smokeless zones and smog; whether existing safety requirements were hindering productivity; and how to save time. The leaders of the discussion groups gave a report to the full conference at the final meeting.

The president this year is Mr R. H. Cobbold, B.A., M.I.E.E. (W. D. and H. O. Wills Branch of the Imp. Tob. Co.), and in the course of his address, he suggested that plant engineers are by their experience particularly fitted to understand machinery. The wealth of knowledge they build up from dealing with machinery in all conditions of operation should be of the greatest value to engineering generally, and more attention should be given to collating, codifying and publishing such information. It is not the prerogative of the top level executives and the chief engineers to have all the knowledge and do all the talking.

Looking to the future, Mr Cobbold saw the Incorporated Plant Engineers continuing to grow, and becoming increasingly accepted as the authority on the use and maintenance of plant. Such an expansion will need a larger permanent secretariat and a more conveniently located headquarters.

Mr Cobbold was followed by Mr H. C. I. Rogers, chief engineer of the Imperial Tobacco Co., who spoke on "The Challenge of Modern Industry." In the course of this, he suggested that it might not be right to assume that, because machines have over the last 50 years required less and less skill to work, they would continue to do so. They might in fact come to require more intelligence to work, if not manual skill. Turning to the question of the re-equipment of industry he dealt at some length on the difficulty experienced by industrial organisations in finding the money to invest in new capital equipment while taxation ran at its present high level.

However, Mr Rogers continued, the need for re-equipment in British industry had now become more urgent than ever. A recent study by O.E.E.C. had shown that only about 15% of the country's total resources goes to capital replacements and additions of all types; perhaps only 5% to the maintenance and improvement of the capital equipment of private industry. More recently there had been a distinct improvement in the position, but there was a long way to go before the backlog was made good. The engineer had to take an interest in the business and financial as well as the technical sides of industry as part of his answer to the challenge of modern industry.

On the final day of the conference, the Alexander Duckham Memorial Award prize papers were presented. Of special interest to electrical engineers was that which secured the bronze medal (second prize): D.C. Control of Steelworks' Cranes, by Mr J. W. Swallow. This gave a general review of the electrical theory applicable to such machines, and of the constructional detail of the apparatus involved. In the conclusion to his paper, the author noted that already electronic devices were providing safety and control mechanisms, and suggested that the time might not be far away when portable transmitters operated from floor level would call and control the crane.

Engineering in Central Africa

EXPLOITING THE HYDRO-ELECTRIC POTENTIAL OF THE ZAMBESI RIVER SYSTEM

WITH the opening by H.M. the Queen of the Owen Falls Dam in Uganda fresh in everyone's mind, it is appropriate that there should be a reminder that Central as well as East Africa is rich in resources of water power. The occasion for this came in a paper which Sir William Halcrow delivered last week to the Commonwealth Section of the Royal Society of Arts, under the title "Engineering Developments in Central Africa."

The geographical area he considered as comprising three countries recently federated—South Rhodesia, Northern Rhodesia and Nyasaland. The area has great mineral wealth and agricultural opportunities but to realise these greatly improved communications will be required, and a plentiful supply of cheap power.

The great opportunity is for hydro-electric development of the rivers of the Zambesi system, which include besides the Zambesi itself, the Kafue and the Lunsemfwa. At present, water power is in its infancy in Central Africa: the Broken Hill stations and small stations for local supplies at Victoria Falls and Zomba in Nyasaland are the only developments existing.

Early attention was given to the possibility of developing the Victoria Falls, but, although they have a 300 ft drop, and offer an average power of 750 MW, during the dry season the flow of water is reduced to give only a power potential of 190 MW. The topography of the country above the falls offers no opportunity for constructing a large storage reservoir of the size necessary.

Broken Hill mines company stations are sited on the Mulungushi River (20 MW) and on the Lunsemfwa. A larger scheme for 66 MW has been projected on this latter river but it has been deferred pending decisions on the larger Kafue and Kariba schemes.

Situated on the Kariba Gorge on the Zambesi, the Kariba Gorge scheme would make use of water from a 300,000 square mile catchment area. A 400 ft high dam would pond back the river for 160 miles—about the distance from London to Sheffield. There are two possible dam sites, one having greater technical advantages, while the other promises easier foundation conditions. The regulated output of the scheme would be 1,000 MW at 70% power factor, and the cost (1950 price) £44m. Cost of energy would be 0·20d/unit initially and 0·10d/unit when the scheme was completed. After allowing for transmission to load centres, these prices become 0·34d and 0·19d/unit respectively.

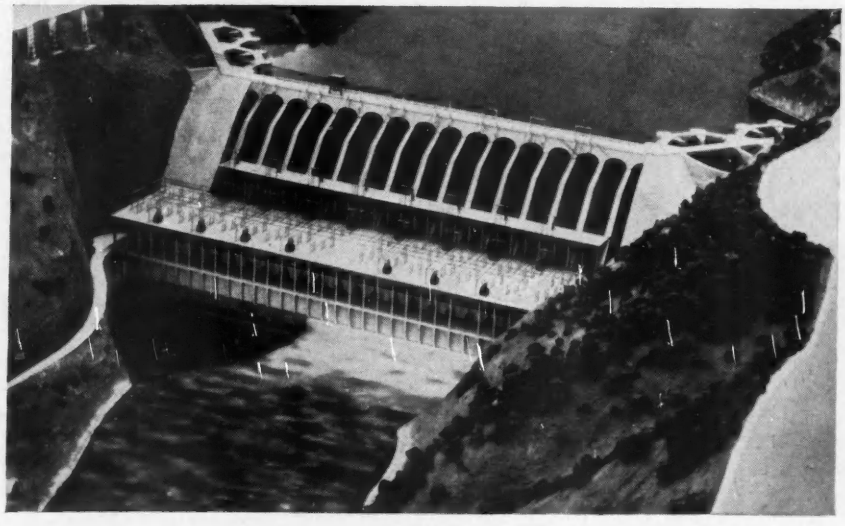
Another possibility is to dam the Kafue, a tributary of the Zambesi, which descends through 1,900 ft in a 16½ mile route through a gorge. Initially, 257 MW at 80% load factor would be available at a cost of £18m, excluding transmission. Energy costs would be 0·15d/unit s.o. and 0·26d/unit at load centres.

Comparing the schemes, if construction of both started at the same time, Kafue could commence to supply power in a shorter time than could a Kariba scheme, and the cost would be lower. The Kariba scheme, however, could be extended to give three and a half times the energy of that based on the Kafue, and then power would be cheaper.

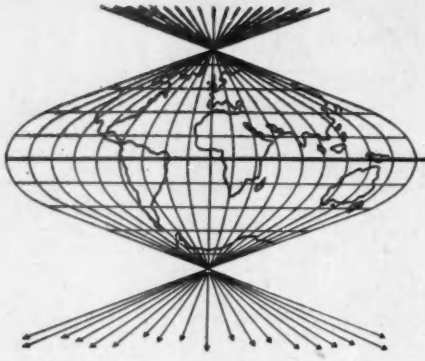
However, to quote Sir William directly, "The Kariba schemes should in no sense be considered as rival schemes but as complementary to each other. Both will undoubtedly be required in the not too distant future to meet the growing demands of Central Africa." For the present, however, with the changes in thinking accompanying Federation, the whole question of choice seems to have gone back into a political melting pot.

Yet, great as the two schemes are, they do not by any means exhaust the power potential of Central Africa. There are other sites of magnitude on the Zambesi and many smaller sites on its tributaries. Turning to Nyasaland, the key is Lake Nyasa, which outflows through the 250 mile long Shire River.

It is the middle section of the Shire, where there is a fall of some 1,400 ft in 80 miles which gives the possibility of power development. There are a number of possible sites and the aggregate power that could be realised is considerable and may be of the order 250 MW.



This model of the proposed Kariba dam was exhibited at the Rhodes Centenary Exhibition at Bulawayo



OVERSEAS NEWS

A SUMMARY OF IMPORTANT EVENTS

CANADA

Development in B.C.

Over 1,901 million units were sold by the British Columbia Power Corporation Ltd. during the year ended 31 Dec. last—an increase of 15·1%. The company connected a further 11,202 consumers to its system, making that total 254,179 at the end of the year. As a further indication of the expansion taking place, the average annual consumption per domestic consumer increased from 2,734 units in 1952 to 2,974 last year. The company is, of course, carrying out an extensive development programme—earlier this year a $3 millions order was placed by its subsidiary, the B.C. Electric Co., with British Insulated Callender's Cables Ltd. for 77 miles of underwater 138 kV gas-pressure cable to transmit power from the mainland to Vancouver Island. Mr A. E. Grauer, president of B.C. Power Corpn. Ltd., has said that this cable meant an indefinite staving off of the day when more expensive steam power must be used. Last year over $5·3 millions were expended on electric extensions alone, in addition to $6·5 millions on substations, etc., $1·5 millions on transmission system, and over $5·3 millions on hydro-electric development.

A Quebec Scheme

Within the next five years the Municipality of Westmount, Quebec, plans to spend about $1 million on modernising and expanding its power distribution services. This information is given by Mr T. J. Hughes, the city manager, in his annual report. In this, he explains that a report on the conditions and prospects of the Light Department was recently submitted to the city council, who approved in principle the proposed scheme. While the necessary plans are being prepared negotiations are under way with the Quebec Hydro-Electric Commission to ensure an adequate supply of power.

More Plant Wanted

The Gatineau Power Co. is preparing plans for the installation of a new 45,000 h.p. generator at its Paugan Falls plant on the Gatineau River. This news has been given by the president, Mr G. G. Gale. The new set is hoped to be ready by late in 1955. Reviewing the company's activities, Mr Gale said that to meet the increased demand for power, 10,000 h.p. was taken from the Quebec Hydro-Electric Commission over the new line from Cedars to Lachute, and it was planned to take an additional 10,000 h.p. from that source later this year. Several thousand new consumers had been added to the distribution system during the year. Extensive use of household appliances was indicated by the "amazing" increase in consumption by the average residential customer, he reported. Average home consumption rose from 850 kWh per annum 10 years ago to a record of 2,100 kWh in 1954, an increase of 225%. The Gatineau Power Co. operates over an extensive area of Eastern Canada. It now owns and operates 17 generating stations with an aggregate installed capacity of 767,634 h.p.

A Joint Project?

It now seems that two large organisations, one Canadian and the other from the U.S., which have been competing to obtain the use of the Yukon River for power development, may join forces to promote large industrial projects in that region. The concerns are Frobisher Ltd. and Aluminium Co. of America. Both put forward proposals to the Federal and British Columbia governments, and recently discussions took place with representatives of the concerns. The Aluminium Co. had in mind the establishment of a $400 millions plant near Skagway, using power obtained from the Yukon River. Frobisher Ltd., a mining exploration and development company, proposed to use power from the river completely within Canada by diverting water to the sea near the head of the Taku River. The power developed would be used for smelting purposes.

MIDDLE EAST

Power Expansion

In the development plans of the Turkish Government great importance is attached to the establishment of more hydro-electric stations to supersede the steam stations. The construction of these stations will make it possible to bring the village electrification problem nearer a solution. Since the present government took office it has allocated £T550 millions to various electrical projects. It has also decided to put into operation a programme involving a further £T500 millions to be commenced in the near future. Power generated in Turkey amounted to some 790 million units in 1950, but last year the figure was 1,200 millions. When the fourteen medium sized regional hydro-electric stations now under construction come into operation, power production will amount to 2,500 million units annually by 1956. In addition to the hydro-electric stations, extensions are taking place at the Catalagzi thermal station, and contracts have been placed for the 60 M Tunebilek and 40 MW Soma thermal stations. These stations are expected to begin operating at the end of 1956. At the same time four projects for irrigation, flood prevention and hydro power stations have been prepared for Gediz-Dernirkopru (70 MW), Kizil Irmak-Irfauli (100 MW), Akcay-Kemer (48 MW) and Yesil Irmak-Oynuz (40 MW). The Provincial Bank has already placed contracts valued at £T78 millions for smaller stations for various towns, and contracts have still to be awarded for further lengths of transmission lines in the vast grid network to be set up.

AFRICA

Outside Opinion Sought

In view of the recent controversy over the merits of the Kafue hydro-electric scheme in Northern Rhodesia and the Kariba Gorge project, Southern Rhodesia, the Central African Federation has decided that a Federal Board shall be appointed to study the two schemes. Announcing this last Thursday, Sir Malcolm Barrow, Minister of Commerce and Industry for the Central African Federation, said that the chairman of this new Board would be selected from outside the Federation and would, therefore, be impartial. There are to be four other members. The Federal Government, however, hasn't changed its own view, which is that priority should be given to the Kafue scheme. This new Board is to be charged with the preparation of all data relating to the construction of the two schemes and—subject to certain safeguards—with the placing and supervision of contracts in connection with their establishment.

Another Proposal

It was also announced last week that a large industrial group has made an offer to the Rhodesian Federal Govern-

ment to finance and construct the Kariba Gorge hydro-electric scheme in Southern Rhodesia in return for a 50-year franchise to supply power to the Federation. This information was released by the Joint National Council of Southern Rhodesia.

PAKISTAN

Power from Gas

The Pakistan Parliament has authorised the Pakistan Industrial Development Corporation to develop power from natural gas found at Sui in Baluchistan. The Minister for Industries has said that power from Sui gas would be cheaper than any other form of electricity now being consumed by industries. First supplies will be available in Karachi next year. The Sui gas field was only recently proved, but plans have quickly been drawn up to utilise it. As a convenient fuel for i.c. engines and gas turbines, there is obviously tremendous opportunity for electricity generation and it is this sphere which is to be dealt with initially, we understand. Already it has been decided to construct a 350 miles long 16 in. dia. pipeline which will cost about £10 millions. Financial assistance is to be provided by the World Bank, in addition to the oil and petroleum concerns which have carried out the work of exploration. The gas area at Sui is about 292 miles north east of Karachi. Its reserves are said to be sufficient to supply 100 million cu ft/day for 60 years. The estimated demand for power plant and cement works along the route during the first stage of the Sui gas development totals some Rs.6·8 millions. It is envisaged that West Pakistan's industrialisation plan will be greatly facilitated by the development.

AUSTRALIA

Finances Being Sought

Tasmania is to seek at least £10 millions for power development at the June meeting of the Commonwealth Loan Council. This news has been given by Mr Cosgrove, the State Premier. He said that in the coming financial year they would concentrate on completing the Wayatinah power project which will have a capacity of 140,000 h.p. Civil engineers had finished at the Tungatinah station and were now working on the tunnel at Wayatinah, he added. Engineers were also working on the construction of the Lake Echo dam. At the bottom of this dam would be a turbine which would develop 45,000 h.p. The Premier pointed out that the main use of the dam would be as a storage basin for the Tungatinah scheme. He also announced that the fourth 35,000 h.p. turbine at Tungatinah would come into operation at the end of this month. He estimated that the Wayatinah and Lake Echo schemes would be finished in 1958.

Extension Wanted

The Electricity Trust of South Australia has been asked to consider extending its lines to supply power to Broken Hill. The suggestion has been put forward by Mr Cahill, Premier of New South Wales. Development of the uranium field at Radium Hill is being accelerated by power provided by a 132 kV transmission line from Osborne power station, South Australia. It has been suggested for some time that the line might be extended a further 70 miles to Broken Hill where several plant breakdowns have occurred recently, it seems. The matter is under consideration, we understand, meanwhile it is assumed locally that the N.S.W. authorities would bear the cost of the necessary work.

NEW ZEALAND

Aid for Some?

The suggestion that the more prosperous power boards in New Zealand would have to make more worthwhile contributions to assist smaller rural boards in their distribution programme, was made by Mr C. J. Lovegrove, president of the N.Z. Power Supply Authorities Association, recently. He said that his tour of the South Island had shown him that the Dominion would have to do something more to assist the smaller rural boards. He was appalled at the conditions under which some of the smaller boards were operating but he admired the courage they showed in their efforts to develop back areas. In his opinion the remedy was a substantial increase in the subsidy grant to rural boards under the Act, a matter which he proposed to raise at the Association's next conference.

Further Expansion

As revenue from the last financial year exceeded expectations the Thames Valley Electric Power Board, New Zealand, has decided to reduce its tariff. Mr G. P. Lindsay, the chief engineer, has reported that 1,314 new consumers had been connected during the past year, the total now amounting to 20,128. Now connected to the Board's system were 8,480 ranges, 11,786 waterheaters, 2,778 industrial motors and 9,901 motors on farms of which 4,525 are milking motors.

FAR EAST

Plans for Development

In Tokyo last week, an Asian regional technical conference on water resources development was held to review recent advances. Particular attention was devoted to the planning and execution of multi-purpose river basin development programmes, the aim being an overall integrated planning that would include within one given area flood control, irrigation, hydro-electric power and soil conservation. Obviously in such cases where parts of several states occupy one river basin, international co-operation would have to be sought, but it is by such meetings, organised by the United Nations Economic Commission for Asia and the Far East, that objections to such schemes can be dealt with. At last week's meeting, it was said that Japan alone anticipated expending about £130 millions within the next four years on various water resource projects.

Now nearing completion is the Borsod power station in Kazincbarcika, Hungary, a photograph of which is shown alongside. Ultimately it will be the largest thermal power station in Hungary. The initial section of the station is expected to go into operation probably in July or August next. There are being installed four boilers giving steam at a temperature of 500–510° C. at an output of 300 klb/hr. Much of the equipment was obtained from Eastern Germany, we understand, and was installed by technicians from that area

Personalities

IN THE INDUSTRY

At the short Executive Committee Meeting immediately following the Annual General Meeting of the Electrical Association for Women, **The Dowager Lady Swaythling,** O.B.E., was re-appointed President. **Miss N. Balls,** J.P., was appointed chairman; **Miss H. Shaw,** B.SC, vice-chairman; and **Councillor Mrs Letitia Bell,** honorary treasurer.

Lt.-Col Claud Hardie, D.S.O., has resigned from the board of Gillott Electro Appliances Ltd. **Mr J. A. Fraser,** general sales manager of Southern Areas Electric Corporation Ltd., has been appointed a director in his place. Mr Fraser is also a director of Ross, Courtney and Co., Ltd., and New Day Electrical Accessories Ltd., both subsidiaries of the Southern Areas Electric Corporation Ltd. Lt.-Col Hardie has also resigned from the board of Globelite Industries Ltd., and in his place, **Mr A. H. Popham,** C.B.E. (who is joint managing director of Mawdsley's Ltd.), has been appointed a director.

Mr E. J. Leaver has been appointed manager for the Carron Co., Ltd., in succession to **Mr B. W. Payne.** Mr Leaver joined the company in 1942 as cost accountant, became chief accountant in 1950 and assistant manager in 1952.

We learn that **Sir Alexander Roger,** K.C.I.E., is to relinquish his position as chairman and a director of British Insulated Callender's Cables Ltd., immediately after that company's annual general meeting on 10 June. He is to be succeeded as chairman by **Mr W. H. McFadzean** C.A., at present deputy chairman and chief accountant, with whom Sir Alexander says "he has worked closely and happily for over twenty years, and since the amalgamation has been his right hand man." Sir Alexander Roger retains his chairmanship of the Automatic Telephone and Electric Co. and other concerns. On behalf of those companies he has travelled extensively abroad. He was for some time chairman of the Birmingham Small Arms Co., and during the war acted as chairman of the Tank Board. He was chairman of the Ministry of Supply mission which visited India, the Middle East, Africa, Malaya, Hong Kong and New Zealand in 1940. He was also chairman of the Telephone Development Association for its first six years. Sir Alexander Roger joined the board of British Insulated and Helsley Cables Ltd. in 1918 and was elected chairman in 1930. On the amalgamation of the old Callender Co. in June, 1945, he was appointed chairman of B.I.C.C. In paying tribute to Sir Alexander's great contribution in the growth of the organisation, the directors have perpetuated his encouragement of the younger generation by founding a "Sir Alexander Roger Travelling Scholarship" to be awarded each year to a B.I.C.C. employee. Mr W. H. McFadzean, who is 46, qualified as a chartered accountant after reading Law at Glasgow University. He joined British Insulated Cables Ltd. as its accountant in 1932 after serving on the company's audit for five years. He played a very prominent part in the negotiations leading up to the merger of the former B.I. and Callender companies, and was appointed to the board on the formation of B.I.C.C. In June, 1947, he became deputy chairman—at 43 the youngest man ever to hold that position—and this was followed in March, 1950, by his appointment as chief executive of the company. Mr McFadzean, too, has travelled extensively to many parts of the world on behalf of the company.

Mr C. T. Melling, chairman of the Eastern Electricity Board, has been re-elected president of the Ipswich and District Electrical Association. The new chairman is **Mr H. E. Wright,** of Thirkettle and Wright, electrical contractors, who is one of the original members of the Association. **Mr S. Hardy,** of B.X. Plastics, is vice-chairman.

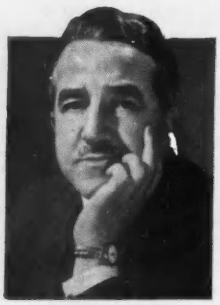
Mr R. J. Dickson, M.I.H. & V.E., heating and ventilating engineer in the chief engineer's department of the London County Council, has been recommended by the General Purposes Committee for promotion to the post of a divisional engineer in that department.

At the annual general meeting of the Institute of Physics, **Sir John Cockroft,** director of the Atomic Energy Research Establishment at Harwell, and chairman of the Defence Research Policy Committee, was elected president. **Mr G. R. Noakes** was elected a vice-president, **Dr S. Whitehead** was re-elected honorary treasurer, and **Dr B. P. Dudding** re-elected honorary secretary. The two new Ordinary Members of the Board elected were **Dr K. A. G. Mendelssohn** and **Mr H. P. Rooksby.**

Mr R. P. Mason, commercial manager, and **Mr C. L. Chapman,** chief development engineer of Venner Accumulators Ltd., are due to leave from Tilbury on Saturday, 26 June, for a fortnight's business trip to Norway and Sweden. Consultations on the Venner lightweight silver-zinc accumulator with the Norwegian Armed Forces and technical discussions with research laboratories will take place in Norway. The visit to Sweden is to discuss technical and commercial progress with the Swedish licensees.

Formerly with the Brush Electrical Engineering Co. Ltd., **Mr R. M. W. Grant,** B.S.C.(ENG.), M.I.E.E., M.I.MECH.E., A.M.I.I.A, has been appointed manager of the Transformer Works of the General Electric Co. Ltd., Witton, in succession to the late Mr C. H. Nunn. Mr Grant graduated in 1928 at Glasgow University. After completing his apprenticeship with Johnson and Phillips Ltd., he was appointed a designer in their Transformer Department and became chief designer of the Department in 1934. Two years later he joined Marconi's Wireless Telegraph Co. Ltd., as development and design engineer and subsequently was in charge of the high power transmitter group. From 1946 to 1948 he undertook development work on servo units for guided missiles as a senior experimental officer of the Ministry of Supply, and in 1948 joined the Brush Electrical Engineering Co. Ltd. as chief engineer, Transformer Division. He was appointed their chief engineer and works manager in 1952.

Sir Alexander Roger



Mr W. H. McFadzean

Mr R. M. W. Grant

Exhibited in this year's Paris Salon is a bronze by Josephine de Vasconcellos of **Mr Thomas Atherton,** chairman of the Dorman and Smith group.

Consequent upon his recent executive appointment with the Benjamin Electric Ltd. in London, **Mr Howard Long,** M.I.E.E., F.I.E.S., has moved from Solihull to 58 George's Wood Rd, Brookman's Park Herts. (Telephone Potters Bar 3701).

Sir George Briggs has accepted an invitation to become a director of the Brush Group. Sir George is a director of Tube Investments.

For health reasons, **Mr Ernest Brook,** now 80 years of age, founder of the firm now known as Brook Motors Ltd., was unable to attend the ceremony at the Huddersfield office last Thursday, when a bronze bust of Mr Brook, subscribed to by the employees, was presented to the firm to mark its jubilee. The bronze bust was received by his two sons, **Mr Frank V. Brook,** chairman, and **Mr John L. Brook,** vice-chairman, from **Mr Harold Frith,** manager of the Leeds sales office, who began working for the firm 46 years ago. The day following the ceremony, 4,000 employees and their friends from the Huddersfield and Barnsley works travelled in nine special trains to Llandudno as guests of the directors.

The Rt Hon Lord Ramsden is resigning from the board of British Insulated Callender's Cables Ltd. as from 10 June owing to impaired health.

Mr W. N. Powell, A.M.I.E.E., M.(S.A.)I.E., is relinquishing his position as assistant-engineer (consumers) with the Electricity Supply Commission of South Africa (Rand Undertaking) at the end of June to re-join Hubert Davies and Co. Ltd., Johannesburg, as technical engineering assistant to the managing director. Mr Powell went to South Africa in 1938 as generation engineer to the Port Elizabeth City Council. From 1942 to 1945 he was city electrical engineer, Bloemfontein, and from 1945 to 1951 manager and chief engineer of the Electrical Contracts and Transmission Lines Departments of Hubert Davies and Co. Ltd.

It is announced that **Mr D. L. Pollock** has joined the board of Vickers Ltd.

Mr W. M. Spence receives the gift from Mr E. T. White

Our accompanying photograph was taken at the Founders' Day ceremony at Manchester University, to which we referred last week, when Honorary Degrees were conferred upon several people. Among those who each received the Doctor of Laws were **Sir Joseph Hallsworth,** chairman of the North Western Electricity Board, seen seated on the extreme left, and **Sir Arthur Fleming,** director of research and education, Associated Electrical Industries Ltd., who is seen seated on the extreme right.

At Manchester University's Founders' Day

Next weekend will bring the retirement of **Mr W. R. Abram** from the position of Weald district manager to the South Eastern Electricity Board. As we noted in our 28 Jan. issue, his successor is **Mr W. J. Collins,** who has been deputy manager of the Weald district since 1950. Earlier, Mr Collins was deputy district manager at Tunbridge Wells, having been deputy borough electrical engineer there prior to vesting day. His early experience was gained with the Stoke Newington and Bromley (Kent) undertakings.

Mr John S. Selley, general sales manager to Universal Boilers and Engineering Co. Ltd., and Burnley Aircraft Products Ltd., has relinquished his appointment on being appointed to the boards of associated Companies in the Aluminium Castings Co. Ltd. group. Mr Selley is now a director of the Atkinson-Hacker Tractor Co. Ltd., and Atkinsons Agricultural Appliances Ltd. Entering the Electrical industry in 1926, Mr Selley trained with Chamberlain and Hookham and Metro-Vick Supplies. He was with Venner's from 1931 until the war, when he served in the R.A.O.C., being released in 1946 from a war office appointment of assistant director with the rank of Lieutenant-Colonel. Mr Selley has been vice-chairman of the B.E.A.M.A. Domestic Appliance Section for the past two years. He is the son of Mr Frank Selley, formerly chief engineer of the St. Marylebone undertaking, who is in very good health, we are pleased to hear.

Mr W. M. Spence, who represented Ashley Accessories Ltd. in Lancashire for 25 years, recently retired on reaching his 75th birthday. Our accompanying photograph was taken at a farewell luncheon when Mr E. T. White, chairman and managing director, presented Mr and Mrs Spence with a silver tea service on behalf of the board.

Mr H. S. Chapman, treasurer of London Transport, retired last weekend. His successor is **Mr H. W. Aldridge,** A.M.INST.T., formerly deputy treasurer.

OBITUARY

Mr K. J. Noble, who died recently, was actively concerned in the work of the International Electrical Association from its inception until retiring on account of ill-health in 1947. He had in fact been engaged in export work throughout his career. With several other English engineers he joined the A.E.G. Foreign Department in Berlin in 1913, but managed to cross the Dutch frontier in the following year before war was declared. He joined B.T.H. before the end of 1914, and at the end of 1918 was in the export department at Rugby. He worked for a time in Russia. For some time after the war he was concerned with export turbine sales and later took charge of the first South African railways contract, and his last years with B.T.H. were spent as representative of the Export Department in London. At the end of the 1920's Mr Noble assisted Mr Lusk in the formation of the world-wide association of firms manufacturing electrical and allied plant for which the name International Electrical Association was chosen, and as its director and secretary, he was entrusted with the building up of the structure and assisting the members.

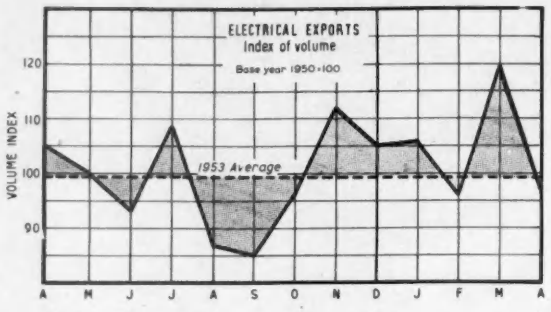
Mr W. J. Smith

Mr W. J. Smith, chief resident engineer for B.V.C. Industrial Constructions Ltd., died on 3 May aged 57. Prior to joining B.V.C. he was for many years with International Combustion Limited.

Mr S. Hiddleston, M.I.MAR.E., who was in charge of the Eastern Department of James Howden and Co. Ltd., for more than 25 years, died on 7 May.

Mr W. F. Marsh, a director of the British Driver-Harris Co. Ltd., died on 20 May.

EXPORTS and IMPORTS



Statistics for April

WITH the incidence of the Easter holiday during April, it was hardly to be expected that the phenomenally high volume of exports during March would be maintained last month. Although the fall is made to seem all the greater by the March figure, the volume of exports during April was, in fact, only little less than the monthly average for 1953. This is indicated by the graph of the ELECTRICAL TIMES volume index above, the index standing at 97 for April, against a 1953 average of 99. As against the index for April of last year, 105, this year's April figure is also seen to be somewhat down. Index figures are based on 1950 as 100.

In value, April exports of electrical equipment amounted to £14,074,867, although this figure is the total for electrical machinery, apparatus and appliances listed in Division 16, Class D of the Trade Accounts. It does not include the value of exports of electrically-operated washing machines and refrigerators, which when added to the Division total, give the grand total value shown in the table below.

Of the domestic appliances it will be seen that the April exports of refrigerators of up to 12 cu ft capacity were over £100,000 higher than in March, while the total for vacuum cleaners shows a marked increase.

As a further indication of the trend in exports, in the first four months of this year the value of electrical apparatus listed in our table sent abroad totals £62,471,908, compared with £62,066,409 in the corresponding period of 1953.

The Union of South Africa again took the largest amount of our electrical exports last month, with a figure of over £1,900,000. Australia was second in the list with over £1,400,000 and India third with a value of more than £1,140,000.

Description	Exports Value (£)			Imports Value (£)	
	Monthly Average 1952	April 1953	April 1954	April 1953	April 1954
Generating Sets:					
Diesel up to 200 kW	408,225	352,284	325,971		
„ over 200 kW	214,949	72,091	200,451		
i.c. driven	31,920	28,147	16,113		
Steam turbine-driven	143,882	829,586	66,299	26,507	86,925
with other prime movers	31,520	11,625	52,916		
Generators	210,823	237,970	195,674		
„ parts	369,110	580,444	319,176		
Motors	892,465	828,094	883,243	36,829	28,902
Motor starters and controllers	234,035	262,193	231,603		
Convertors and rectifiers	103,602	127,176	73,392		
Transformers	873,260	1,277,469	1,025,124	32,806	64,323
Switchgear and Switchboards	1,291,656	1,500,134	1,222,299		
Batteries, primary and parts	212,536	208,120	317,345		
Fluorescent and Discharge lamps	53,194	37,661	46,959		
Other lamps	123,932	123,589	116,479		
Radio and Electronic gear	1,916,241	2,148,518	2,304,268	316,060	712,831
Telephone and Telegraph Plant	1,372,016	1,416,517	1,272,444		
Cooking Appliances and parts	114,943	101,546	166,225		
Space heaters	26,489	20,685	51,210		
Water heaters	32,963	29,515	27,362		
Other heaters and parts	128,498	105,647	143,138		
Welding machinery	86,132	122,292	103,347	8,451	3,283
Signalling and Bell equipment	53,722	85,889	79,865		
Commercial Instruments	135,473	127,997	133,665	55,238	51,356
House Service Meters	147,816	88,982	155,717		
Electro-medical and X-ray apparatus	118,910	107,553	112,899	37,419	33,670
Fans	110,447	127,753	121,781		
Vacuum Cleaners	159,303	109,376	171,961		
Other Appliances and parts	232,481	377,427	339,220		
Portable power tools	112,423	147,136	179,173		
Washing Machines up to 150 lb	443,379*	276,328	288,660		
Power Refrigerators, up to 12 cu ft	565,985	577,259	625,897		
Telephone and Telgraph Cables	746,946	632,911	279,942		
Paper-insulated Cables	883,068	1,015,093	411,384		
Rubber-insulated Cables	622,124	394,798	434,923	18,619	20,803
Winding and similar wires	151,677	127,520	104,517		
Other Cables and Wires	276,939	194,699	252,184		
Accumulators and parts	452,491	315,666	364,025		
Insulating Materials	165,900	120,885	119,876		
Electrical Ware	103,886	89,147	60,613		
All other articles	1,595,762	2,562,131	1,591,504	330,257	275,436
Total	16,051,060	16,057,763	14,989,424	762,186	1,277,529

* Including models of up to 250 lb in weight

POWER SUPPLY Statistics

APRIL

ALTHOUGH, in recent months, new plant commissioned by the British Electricity Authority has been comparatively low, it is several years, at least, since a month passed without even one item being recorded. Such, however, is the position for April—the record stands unmarked by a single entry. The overall picture of the Authority's installed capacity is, therefore, little different from last month, the fall of 24 MW to a total of 18,641 MW being the result of the plant re-rating which takes place at this time of the year. A similar position is seen for the North of Scotland Hydro-Electric Board, whose totalled installed capacity of 567 MW has remained unchanged for the last six months. The joint total of 19,208 MW installed capacity is 1,499 MW above the 17,709 MW recorded at the end of April 1953, an increase of 8·5% over the year.

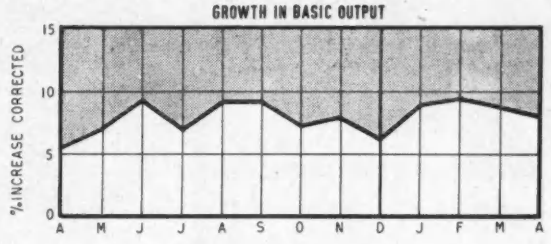
Units generated during the month totalled 5,634 millions, of which the B.E.A. contributed 5,531 millions and the North of Scotland H.E. Board 103 millions. For April last year the total generated was 5,269 million kWh, this year's figure being an increase of 6·9%. Of the total energy generated, 5,520 million kWh came from steam sets whilst hydro-electric stations produced 103 million kWh. Units sent out amounted to 5,294 millions some 94% of those generated.

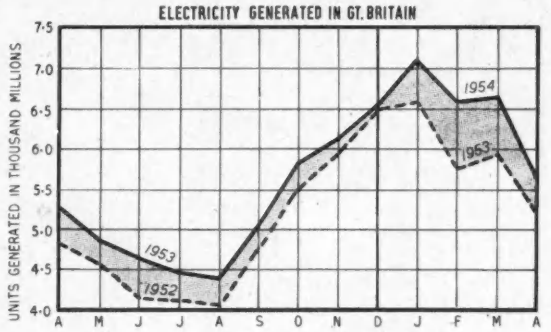
Total Sales by Area Boards and B.E.A. direct were up by 6·6%, this despite slightly warmer weather conditions during the month this year than last. Temperatures averaged 45·8° F. during April, as against 45·4 for April 1953. The number of working days were the same in the two months. When corrections are made for the effect of temperature differences on sales of energy, the increase for last month is seen to be 8% on that for April last year, thus indicating that the rate of growth in basic load being experienced by the B.E.A. is being maintained at an adequate level. It will be seen from the curve of basic load growth, however, that April's figure of 8% is somewhat less than that of the last few months.

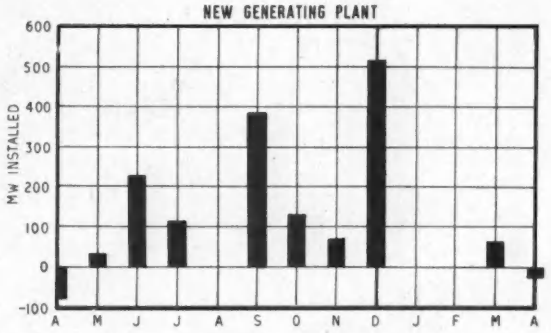
B.E.A. Sales to Area Boards in April

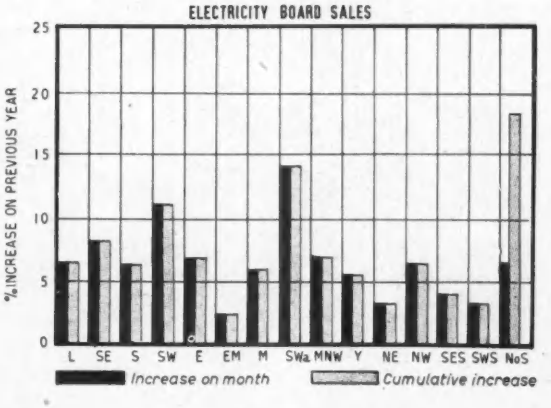
Board	Apr. Sales in million units	% inc. or dec. on Apr. 1953
London	484·2	+ 6·4
South Eastern	292·7	+ 8·2
Southern	334·4	+ 6·3
SouthWestern	169·3	+11·2
Eastern	463·5	+ 6·9
East Midlands	381·2	+ 2·4
Midlands	522·7	+ 6·0
South Wales	308·4	+14·1
Merseyside and North Wales ...	295·4	+ 7·0
Yorkshire	510·0	+ 5·6
North Eastern	304·5	+ 3·3
North Western	570·2	+ 6·4
South East Scotland	111·0	+ 4·1
South West Scotland	262·7	+ 3·3
Direct Sales by B.E.A.	94·2	+21·7
Grand Total	5,104·4	+ 6·6

Looking at the experiences of individual Area Boards, it is seen that most of them record increases between 5 and 10% over April last year. Figures for both the South Western and South Wales Boards, however, continue to reflect the load development in those areas, sales being, respectively, 11·2% and 14·1% above those for the corresponding month last year. Both these Area Boards have shown conspicuously high sales increases during the last few months. Direct sales by the Authority are, similarly, maintaining the steady increase for which they have been continuously noted.









Equipment for Industry

Reyrolle oil-break Switches

ALTHOUGH designed for coupling direct to Reyrolle Class C switchgear, type IC27 oil-break switches recently introduced by A. REYROLLE AND CO., LTD., Hebburn, Co. Durham, are equally suitable for use on their own either as independent units or for building into switchboards with similar units. Having a normal-current rating of 400 A, the type IC27 unit comprises a switch chamber with normal busbar chamber at the rear and c.t. accommodation and cabling arrangements below. In the switch chamber are housed the main switch together with an independent earthing switch, both capable of making and carrying for three seconds a current corresponding to 75 MVA at 3·3 kV, 150 MVA at 6·6 kV or 250 MVA at 11 kV. The main switch is capable of breaking its rated normal current.

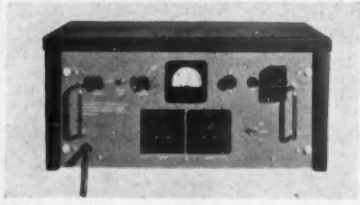
Connections to the switches are brought in at the rear through porcelain thoroughfare insulators from 1·5 sq in. laminated copper busbars. Similar connectors and insulators enter the connection chamber below the switch chamber. Of the single-break, swinging arm type, the main switch, like the earthing switch is manually operated, designed to ensure satisfactory closing under fault conditions. Its fixed contacts are heavy copper clips reinforced by steel leaf-springs, whilst moving contacts comprise gun-metal blades pivoted on a bracket supported by the lower thoroughfare insulator, electrical connection being made by a laminated copper conductor. To obviate flash-over insulating barriers are fitted. For the earthing switch, copper blades, attached to an operating shaft, engage with fixed copper clip-contacts mounted on the lower thoroughfare insulators.

Straight through c.t.'s can be accommodated when required in the horizontal connection-chamber, which, when the switch is used with Class-C switchgear, may also be used to line up the cable boxes below. The connection chamber is compound filled, with adequate space allowed for expansion. Secondary connections are brought out to terminals in the top of the chamber accessible from the back of the panel. Provision is made for cable-testing, whilst neon lamp indication can be provided if required.

Reyrolle's 11 kV fault making oil-break switch

Voltage Stabiliser

AN improved version of their A.C.I. voltage stabiliser, known as the A.C.II is now available from SERVOMEX CONTROLS LTD., Crowborough Hill, Jarvis Brook, Sussex. Designed for operation on a standard single-phase a.c. supply of 40 to 70 c/s, the new version is stated to maintain an output voltage whose r.m.s. value is stabilised to within 0·25%, over its range 200 to 240 V, infinite variation between these limits being provided. The output voltage is claimed to be independent of variations in supply frequency and waveform, and not altered by large changes in ambient temperature. For a total instrument consumption of some 100 W, the stabiliser gives an output current up to 10 A. For a given output voltage, the input may be +6·5% to −17·5% of this value, which is for 230 V output anywhere between 190 and 245 V. Correction speed is 12 V/sec.



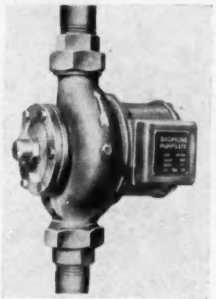
Servomex type A.C.II voltage stabiliser

Although the range of the instrument is 200 to 240 V, provision is made with a simple modification, to draw maximum power output at any required voltage. At 110 V for example, 20 A could be supplied stabilised to the same accuracy as under normal conditions. Components necessary for the modification are supplied according to requirements. Assembled on a steel chassis, the unit has a panel front measuring 19 in. by 8¾ in. and can be inserted into a standard rack if required. A dust cover is used for protection. Input may be made through front or rear, whilst outputs are available both on the front panel and at the back. In operation, the output voltage is applied to a bolometer bridge, which gives zero output at balance. If the output wanders from the set value, the bridge output, suitably amplified, is made to drive a two-phase servo-motor geared to a variable transformer which corrects the output voltage. Velocity feed-back is provided to prevent hunting.

The "Thermopak" heating accelerator

FORCED circulation in central heating systems has many advantages; so many that it is rapidly replacing the thermo-syphon system in industrial and domestic systems but the efficiency and reliability of this method depend primarily on the accelerator.

"Thermopak" accelerator is silent in operation



The "Thermopak" introduced by SIGMUND PUMPS LTD, Team Valley, Gateshead 11, offers many extra and outstanding advantages; first is its silence due to special design features, sleeve bearings and silent motor. There is no noise whatsoever to be transmitted and magnified in the pipe circuit and no motor hum.

Second feature to note is the absence of glands. The Thermopak is glandless and has a single shaft which serves both motor and accelerator.

The Sigmund Thermopak accelerator is a compact, lightweight, super silent, streamlined electric accelerator, of precision construction. The complete unit is made up of a single or three-phase electric motor which is interference free, and of a pump designed so as to obtain a high output while at the same time offering little resistance to the passage of the water when the accelerator is stopped.

The entire rotating element, including the electric motor, is separated completely from the stator and windings by a shell of non-magnetic metal. The bearings, very widely dimensioned, and made of stainless steel and bronze, are lubricated by circulation of the water and do not require any other lubrication. These are not located in the main circuit, but are lubricated by water drawn off from the circuit along the shaft of the unit. This results in remarkable reliability.

The absence of a stuffing-box has many favourable advantages. There is no gland leakage, no need for constant tightening of gland, no mechanical seal. Absolute water-tightness is assured.

New Hurseal Models

THE range of "TV" radiators has been extended by HURSEAL LTD., 229 Regent St, W.1, and a thermostat incorporated in these models at no extra charge. These thermostats are, the company say, the result of two years' research work and have reached a high degree of efficiency. They point out that to obtain the greatest efficiency in the use of low temperature surface heating separate air thermostats are recommended, but the introduction of the incorporated thermostat is to satisfy a demand for radiators complete with thermostat ready for connection to the supply mains.

In addition to the standard colours of bronze and cream, radiators will now be available in eau-de-nil and pastel blue.

A New Pack for the "Philishave"

A NEW type of case for the "Philishave" dry shaver has been introduced by PHILIPS ELECTRICAL LTD., Century House, Shaftesbury Ave, W.C.2.

Made in a pleasing shade of grey and fully lined the new pack is specially designed to take the Philishave complete with adapter plug and is fitted with a securing strap to hold the shaver head in a neat coil. It will be available from the middle of this month and the price of the Philishave in its new pack remains at £7. 9s. 3d. (tax paid).

The new pack

Trade Publications

ACCESSORIES.—A new (March 1954) catalogue of electrical accessories has been published by GEO BECKER LTD., Ampere Works, North End Rd, Wembley Park, Mddx.

TELEPHONE EQUIPMENT.—Engineering Bulletin 2162, issue No. 3, published by COMMUNICATION SYSTEMS LTD., Strowger House, Arundel St, W.C.2, is entitled "Strowger private automatic telephone exchange equipment type 200-20A 200 lines and 20 connecting links."

CONTROL AND METERING.—A publication describing the operation of the S.E.I. electromagnetic transducer system has recently been issued by SALFORD ELECTRICAL INSTRUMENTS LTD., Peel Works, Silk St, Salford 3, Lancs.

RADAR EQUIPMENT.—Operational details with pictorial illustrations of the Radiolocator IV P.P.I equipment have been published in booklet form Ref. OLRA.8 by MARCONI INTERNATIONAL MARINE COMMUNICATION CO., LTD., Chelmsford.

RESINS AND GLUES.—A catalogue entitled "A Guide to Resins and Glues for Industry," covering the company's range of synthetic resins, glues and casein glues is available from LEICESTER LOVELL & CO., LTD., N. Baddesley, Southampton.

New "Gossamerlite" shade

NEW shade added to the "Gossamerlite" range of lighting fittings by the GENERAL ELECTRIC CO. LTD., Magnet House, Kingsway, W.C.2, entitled "Sunburst Minor," sells at £1. 17s. plus 6s. 2d. p.t.

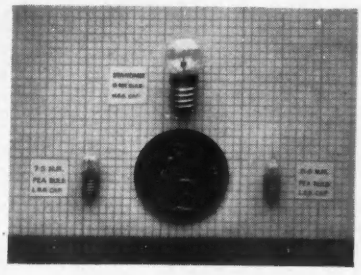
Numbered F.2829 this shade is 6½ in. in diameter and the main colour is green. The sunburst motifs which are the same as those on F.38050 are in red, white, black and yellow.

L.e.s. Bulbs by Vitality

FOLLOWING on the introduction of the new l.e.s. pilot lampholders by Bulgin's (see ELECTRICAL TIMES, 13 May), VITALITY BULBS LTD., Neville House, Neville Place, Wood Green, N.22, have now in production l.e.s. capped pea bulbs covering a range of ratings from 1·5 V to 28 V.

The photograph shows two of these new bulbs compared with a standard m.e.s. bulb. The overall lengths of these are (*a*) for the 5·5 mm. diameter bulb, 17 mm. ∓ 1 mm. over pip. (*b*) for the 7·5 mm. bulb 16 mm. ∓ 1 mm. (no pip). Standard ratings of this range are as follows: 1·5 V, 2·5 V, 3·5 V amperage up to 0·3 A; 4 V up to 0·25 A; 6 V up to 0·2 A; 12 V up to 0·15 A; 20 V up to 0·1 A; 24 V and 28 V in 0·4/0·6 A only.

The 5·5 mm. lamp is at present only available in 2·5 V, 0·3 A, but the firm emphasise that they can "tailor" these lamps to customers requirements.



Two of the new l.e.s. lamps compared with an m.e.s. lamp

The "Litesold" Soldering Tool

A REALLY lightweight miniature soldering tool, the "Litesold" has now been marketed by LIGHT SOLDERING DEVELOPMENTS LTD., 106 George St, Croydon, Surrey.

The "Litesold" range comprises ⅛ in., 3/16 in., ¼ in. and ⅜ in. diameter bit models with either fixed or replaceable bits and are supplied in the following a.c. or d.c. ranges: 6/7, 12/13, 20/22, 22/24, 50/55, 100/110, 200/220, 230/250 V. Models for special voltages or low melting point solders are supplied to order at no extra charges.

Weights, lengths, loadings and heating speeds given are: the ⅛ in. bit model weighs 2 oz with flex, is 6 in. long and rated 12 W, takes 1 min. to reach 250°C and 3½ mins. to reach saturation temperature of about 400°C. The figures for the 3/16 in. are respectively 3 oz, 8¼ in., 23 W, 1½ min. and 5 min.; for the ¼ in. model 3½ oz, 9½ in., 27 W, 1¾ min. and 6 min.; and for the ⅜ in. model 5 oz., 10¾ in., 40 W, 2½ mins. and 7 mins.

The ⅛ in. bit model with its fully insulated mains element is a tool which will prove invaluable to the instrument electronic or radio engineer both in the workshop and at home for ultra light soldering on intricate work in awkward and confined spaces. A cover is supplied with this model, to protect the element from damage, which can be replaced immediately the mains supplies are cut off, an important point for servicing engineers who carry their equipment in a tool bag.

The company has available vertical type shields as shown in our photograph which can be fixed to the wall, bench or to a small base. These are useful on assembly lines where the soldering tool is in constant use.

The "Litesold," shown in a vertical type shield

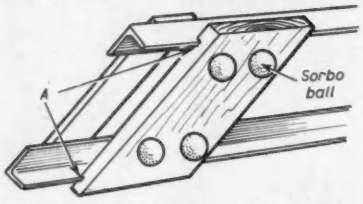
For the Electrical Trade

PROBLEMS AND PRACTICE

In Engineering

Resilient Mounting

AN ingenious method of resiliently mounting a f.h.p. motor on rubber heels was recently described in these columns. While a wide variety of resilient mountings of rubber bonded to steel can certainly be bought, they are seldom available for an emergency rig up. As another example of emergency mounting, a rotary converter weighing about 10 cwt and mounted on an angle iron base, had to be installed on a wood floor without a ceiling below. As only to be expected the floor acted as a sounding board and the noise in the shop underneath was considerable. The set was therefore mounted as shown below.



Method of fixing Sorbo rubber balls in a wooden block to prevent the transmission of vibration

Two pieces of wood were channelled at (A) on a circular saw to fit an angle iron closely. Alternatively two battens could be screwed on to give the same result. Four 2 in. holes were sunk ½ in. deep with an expanding bit on the underside of the two boards and the complete rotary converter rested on eight solid Sorbo rubber dog balls located by the recessed holes. The arrangement was extremely successful.—*K. Wilkinson.*

Checking the Speed

THE revolution counter described and illustrated in the 22 Apr. issue is an ingenious device, but from a practical point of view it has, I feel, several limitations, and even dangers. While the photograph shows, for clarity no doubt, a motor shaft bare of coupling or pulley, it is seldom necessary to check the speed of a motor when running unloaded. The presence of a pulley on a motor shaft and the proximity of the driving belts would alter the conditions completely, and to my mind the fact that one needs to use both hands for this device and particularly to hold a nut stationary on a spindle running at 1,500 r.p.m. with the hand in close proximity to running belts, is dangerous.

The instructions include a direction to run the nut up to the cone at the end of the 4 B.A. stud when the motor rotation runs the nut away from the cone. This means placing one's fingers in close contact with the motor shaft, when one's hand must be close to the pulley rim.

Every engineer has a story to tell; why not tell yours on this page? We welcome contributions to this feature, and those published will be paid for at our standard rates. Problems which are encountered and overcome in day-to-day maintenance or installation of electrical plant; useful methods and techniques developed for specific jobs, or current practices, all make instructive reading for others. We will also consider for publication problems requiring an answer. Sketches are often helpful and need only be rough, as they will be redrawn before use.

Further, how can this be done, one wonders, without removing the pulley guard —an advantage which is claimed in your contributor's last paragraph.

The stiffness of a 4 B.A. stud does not allow the requisite pressure to be used to ensure no slipping of the cone in the end of the shaft, without risk of bending of the stud and the consequent risk of bringing the user's hand in contact with the pulley. While the device may have been useful in dealing with fractional-horsepower motors, as illustrated in the contribution, its cheapness should not obscure its danger when used in ordinary industrial practice. Your contributor's statement that "it will be appreciated that this revolution counter is so cheap that any electrical maintenance man can have one in his toolbox" indicates to me that he holds maintenance electricians in small regard. This somewhat supercilious remark is, I feel, out of place in the columns of the ELECTRICAL TIMES.—*R. A.*

Line Taps

A FEW weeks ago I had just completed an installation for a three-phase, 20 h.p. star delta motor operating a wheat crusher and was making the usual tests before giving it a trial run. I first tested each phase to earth, getting an infinity reading on the "megger" tester, after which, I switched on the supply and gave the motor a trial run off load (pulley belts off). The motor ran up to speed and behaved as expected.

I pressed the stop button, replaced the pulley belts and again pushed the starter handle into the "start" position to give the motor a run on load. The only result was a loud humming noise from the motor.

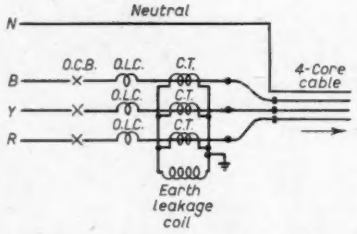
Removing the cover from the starter I checked each phase to earth with a test lamp, getting normal brilliance from each phase. However, on depressing the starter handle, still with the test lamp from each phase to earth, I found that one of the phases showed merely a glimmer while the other two were at normal brilliance.

At first I naturally assumed this to be bad connections, but upon checking found all secure. In despair I depressed the starter again hoping for the miracle that never happens and this time it happened.

Immediately one of the warehousemen rushed in to inform me that a firework display was taking place in the street outside. Getting him to depress the starter handle momentarily I watched from the door and there saw on the overhead supply a beautiful arc at the line taps. With relief I called up the local Electricity Board and after the linesman had fitted new line taps I tested again and ran the motor up to load—it ran perfectly with no further trouble.—*T. E. Benson.*

The Missing C.T.

A THREE-phase o.c.b. fitted with series overload coils and c.t.s for core balance earth leakage protection was urgently required for use on a three-phase, four wire feeder. Previously this o.c.b. fed a three-phase electrode water heater and, as the original cable was already connected to the breaker, it was decided, as a temporary measure in order to save time, to joint the new feeder to the three core cable, the fourth core being taken direct to the system neutral. After closing the o.c.b. all went well for an hour or two until a distribution fuse on the red phase blew and the o.c.b. opened. The fuse was replaced with one of heavier rating and the overload trips were reset higher.



Circuit of the three-phase o.c.b. are connected to a three-phase, four wire feeder by by-passing the neutral

During the following day the breaker again opened and on resuming the supply load tests were taken on all three phases and neutral. It was then realised what was the cause of the trouble. The effect of the varying current in the neutral had been inadvertently overlooked—there was no c.t. in the neutral and therefore the algebraic sum of the currents in the three c.t.s in the lines did not at all times equate to zero. When the unbalance became sufficiently high the earth leakage coil responded and caused the o.c.b. to open. A very simple trouble but one can generally be wise after the event.—*E. A. Robbins.*

NEWS OF THE WEEK

Monopolies Ban on C.M.A.

Government to enforce Commission's Findings

ALL except two of the Monopolies Commission recommendations on the supply of electric wires and cables have been accepted by the Government. This was made clear by the Minister of Supply in a written answer to a Parliamentary question last week. He said that "after a thorough examination of the complicated issues involved," the Government have asked the trade associations concerned to give an assurance that they will bring their arrangements into conformity with the conclusions of the Commission by the end of the year. The two exceptions are the recommendation that the relationship between prices charged to the B.E.A. for cable and those charged to other users should be published; and that calling for price agreements for sales of telephone cable to purchasers other than the G.P.O. should be brought to an end. The first of these is considered contrary to commercial practice, but the Government have asked the associations to keep them informed about price relationships. Similar information has been requested with reference to the relative prices of sales of telephone cables to the G.P.O. and other purchasers.

This Government statement has come after two years of discussion and consideration, and yet the Minister has only felt it possible to announce at the end "If the trade associations concerned are prepared to give the assurances asked for, it will not be necessary to make an Order under Section 10 of the Monopolies Act." Such an order may declare any agreements or arrangements in an industry to be unlawful, or may require their termination; it requires confirmation by both Houses of Parliament before it comes into effect.

Recommendations in the Commission's report included the working out of a new system of purchasing cables by the B.E.A.; the B.E.A. to be informed of the production costs of member firms of the C.M.A. for ranges of cable in which no competition exists. The system of common prices for rubber cable and covered conductors should be brought to an end. While the fixing of minimum prices for wires and cables should be permitted, they should be subject to review by Government departments to prevent excessive profits.

Any bulk orders should be publicly announced. Quota systems of C.C.A. and C.M.A. associations should be brought to an end, as should "allocation systems" for orders. Exclusive dealing provisions in agreements with wholesalers should be ended, as should aggregated quantity rebates, the E.C.A. rebates and similar arrangements, including undertakings not to make covered conductors.

In connection with these latter requirements, it may be recalled that the Monopolies Commission is at present investigating the general question of such trade practices as aggregated rebates and exclusive dealing. It was asked to do this subsequent to the Wires and Cables report.

Wiring in Prefabs

FOLLOWING our report last week of the Ministry of Housing's recommendations concerning the inspection of electrical installations in temporary houses, we hear of a petition submitted to Doncaster Council by tenants of prefabs. The petition, signed by 90 persons on the Council's Broom House Lane estate, asks for the complete overhaul of the electrical wiring. It arose because there have been ten outbreaks of fire in the 105 dwellings, and residents are anxious for their safety. Many of the fires are suspected to have been caused by faulty wiring. The Corporation has informed the tenants that the wiring will be inspected.

N.C.B's £200,000 Order

AN ORDER valued at about £200,000 for a complete coal preparation plant has been received by Fraser and Chalmers Engineering Works at Erith, the G.E.C. has announced. The plant is for the N.C.B.'s South-Western Division and will be installed at Maesteg in Wales to serve as a central washery for four pits. We understand that included in the contract are conveyors, shaker screens, crushers, all electrical control gear, civil engineering work, lighting, power, and heating.

U.K. Equipment with Canadian Approval

THERE have been so many items of electrically-operated equipment made in the U.K. and approved by the Canadian Standards Association, that the Approvals Agency has published the additions in booklet form. It has been customary for the B.S.I./C.S.A. Approvals Agency to supply lists annually but this has become impracticable over the past twelve months. The booklet contains the names of manufacturers who obtained Canadian approval of their products before 31 Mar. last. Supplementary lists will be issued at six-monthly intervals on 1 Sept. and 1 Mar. each year. Copies may be obtained from the Agency at British Standards House, 2 Park St, London, W.1. Manufacturers are listed in alphabetical order under types of products, and are indexed. There is also a summary of Canadian representatives and their U.K. clients.

A.S.E.E.'s New Offices

AS forecast in our 25 Mar. issue the Association of Supervising Electrical Engineers is moving into new offices in Bloomsbury Square, London. The move takes place today (Thursday) and the full address will be 23 Bloomsbury Square, W.C.1. Both the Association itself and the Electrical Engineers (A.S.E.E.) Exhibition Ltd. will occupy the premises, and telephone numbers will be Langham 5927 for the Association and Langham 5929 and Museum 3450 for the Exhibition. This move should be of immense advantage, particularly in the organisation of the exhibition. Working at Barnet was a severe handicap, and all should benefit by the move into central London.

Plans progress for Development of Scottish Electronics Industry

NEW laboratories being built alongside Ferranti Ltd.'s premises in Edinburgh are expected to be completed in October, we hear. The new building has more far-reaching effects than the mere extension of a company's factory. It is part of a large plan for the development of Scotland's electronic industry, which originated some time ago with the Scottish Council (Development and Industry) and in which Ferranti Ltd. are participating to a large extent. Through the works and laboratories will pass technicians from other firms to study developments in the industry so that they can return to their own firms and put the knowledge so acquired to good use. A pilot course of this nature has already been organised and run with remarkable success. Mr F. S. Barton, principal director of electronic research and development in the Ministry of Supply has recently visited Scottish firms which are linked in this nucleus scheme, and further visits to other companies to define the exact place they can occupy in the industry have also been made.

Continued Progress of Institute of Physics

AT the annual meeting of the Institute of Physics last week, considerable progress was reported in the activities of this young but growing organisation. Membership is often a good guide to growth, and we note that during 1953 there was a net increase of 248 members in all grades. Total membership at the end of the year stood at nearly 5,000. The Institute now boasts 16 local branches.

Among the further qualifications recognised as requirements for membership are the newly established degree in applied physics of the University of Manchester, and the Associateship in applied physics of the Royal Technical College, Glasgow. Another very favourable aspect of the annual report is the success of the Institute's Graduateship examination, introduced in 1952. It was conducted in four centres last year. The number of candidates for National Certificates in Applied Physics is increasing and there were 151 for the Ordinary Certificate and 55 for the Higher Certificate.

Electrical Discovery at Royal Society Conversazione

IT SEEMS a great pity that more people are not afforded the opportunity of attending the annual conversazione of the Royal Society. The numerous exhibits never fail to gain the interest of those fortunate enough to receive an invitation, whether they be technically minded or laymen, or whether, as this year, the exhibit is a pyrophone (an organ based on the singing flame) or the genetics of specific differences in butterflies.

This year was unique in that among the many scientific exhibits was one of more direct electrical interest than is usual at this annual event. This is a possible practical application of the Peltier effect: the phenomena by which an electric current passing across the junction of two dissimilar metals produces heat with one direction of flow, and abstracts it from surrounding matter with the other.

Recent work at the G.E.C. Research Laboratories has led to the development of a bismuth/bismuth telluride junction which can give a cooling effect of nearly 50° F. This was demonstrated at the Conversazione making ice cubes. At present the process is far less efficient than a conventional motor driven refrigerator; none the less work is continuing on the possibility that sources of low grade waste heat might be used with thermo-electric generators to provide the low voltage high-current supply necessary for operating the junctions.

Other items of electrical interest at the Conversazione included a deep sea telephone repeater of a type similar to that which will be sunk for the forthcoming transatlantic cable, a range of radio and radar demonstrations extending from a model of one of the earliest methods of short-range wireless telegraphy to another depicting the 250 ft aperture radio telescope being built at the Jodrell Bank Experimental Station.

For the rest we noted Dr R. Bainbridge's ingenious apparatus for determining the speed at which fish swim. This information can be invaluable in many instances, not least in the design of fish passes and ladders for dams. We could not fail to mention the presence, as in so many years previously, of Sir Geoffrey Taylor, even though his display was in no way electrical. Perhaps he will turn his mind to our problems also on a future occasion.

Photographed at the opening of Irish Cables' new factory in N. Ireland are the Minister of Commerce, Lord Glentoran, Mr W. L. Wray, chairman and managing director of the company; Mr A. C. Bulla, chief purchasing officer for the Electricity Board; Mrs McNeill; Mrs A. Gordon Holt; and Mr E. Sturgess, asst. director of contracts, British Post Office

First Cable Factory Opened in Northern Ireland

OFFICIAL opening of an electric cable factory took place in N. Ireland recently. This is notable in that it is believed to be the only factory of its kind in Ulster. It has in fact been in production for about nine months now but Lord Glentoran, Minister of Commerce, has now performed the official opening ceremony. The factory is owned by Irish Cables Ltd., a subsidiary of Falk, Stadelmann and Co. Ltd., and was built for the company by the Ministry in Castlewellen Rd, Newcastle. At the present time it employs about 85 persons but within the next six months that number is expected to rise to about 220.

Some idea of the new factory's position and plans for future, was given by Mr W. L. Wray, chairman and managing director of Irish Cables at the luncheon preceding the official opening. He said the annual import of electrical cables into N. Ireland was worth £750,000, and that was growing with the development of industry and rural electrification. A sixth of the total value of imports was already being covered by the new factory, he said. Mr Wray added that plans were already complete for a large extension to the works, involving large new plant.

We note that 90% of present production is sold within the U.K., but we understand that extensive plans exist to build up a formidable export trade. This was evident during a tour of the works when, in the stores, were seen consignments ready for despatch to Bombay and Karachi, Singapore, Beirut and Amman.

New Meters in Old Houses

SOME Bristol residents are complaining about the installation of new meters in houses which are due to be demolished. They maintain that the installations are a waste of money. The S.W. Electricity Board have replied, however, that until demolition was imminent they had a statutory obligation to fix meters. The compulsory purchase order had not yet been approved by the Ministry.

Cause of Dalmarnock Explosion Explained

AN explanation of the explosion and fire which took place at Dalmarnock power station on 27 Feb. was given at an inquiry in Glasgow last Thursday into the death of one of the workmen concerned. Mr C. L. Walters, the divisional technical engineer, said the explosion occurred in a switch house during routine maintenance work on the isolating section of the switches. He told how it was intended to lower three dead switches for examination but when the winding apparatus was tried, the oil tanks were stuck and they would not come down. The engineer then tried another three tanks in case he had been dealing with the wrong set of switches. After a few turns of the winding handle, however, there was an explosion and fire broke out. Mr Walters said that because of the type of crank arm fitted it was possible for an earthing arm to touch the contacts before the automatic safety locking mechanism operated. The earthing arm was provided only to remove static electricity and not to take the full load, he explained. The second explosion in the other switch house on the following day was similar. Mr Walters added that in future it was intended to use a mobile earthing point. The jury returned a formal verdict.

OFFICIAL PUBLICATIONS

NATIONAL COAL BOARD. Annual report and accounts for 1953 (see page 780). H.M.S.O. 8s.

BURMA. Report to President of B.o.T. by Industrial Delegation (see page 794). H.M.S.O. 2s. 6d.

COURSE ON NOISE IN ELECTRICAL SYSTEMS

AN explanation of the physical mechanisms involved in electrical conductors in both metals and semi-conductors, will be given in a course being arranged by the Department of Electrical Engineering at Birmingham University. The course is entitled "Theory of Electrical Conduction and 'Noise' " and will take place between 27 Sept. and 1 Oct. at the Centre for Continued Studies, Primrose Hill, Selly Oak, Birmingham 29. It will go on to deal with the theory of fluctuations of current. Examples of the behaviour of semi-conductors will include rectifiers and an introductory treatment of transistors. Fee for the course is £5.

ELECTRIC VEHICLE ASSOCIATION IN 1953

PROPOSAL to run an exhibition of battery electric vehicles in Leeds next year in conjunction with the Y.E.B. is one of the factors mentioned in the annual report for 1953 of the Electric Vehicle Association. We note too that the Association has been granted constituent membership on the Council of B.E.P.C. The secretary, Mr V. W. Dale, will be the Association's representative. At the end of 1953 the Association had 29 full members and 26 associate members, including B.E.A.M.A.

Golf in London

LONDON'S qualifying competition for the E.I.B.A. National Golf Championships is to take place at the Berkshire Golf Club, Ascot, on 1 July. All in the electrical industry in the area are invited to submit golf cards, which may be obtained from Mr L. H. Welch, 60 St. Martin's Lane, London, W.C.2. The best 75 completed cards received by 14 June will qualify to play. A foursome competition will take place in the afternoon.

The First Half-Century

Last Friday evening every seat in the theatre of the Royal Institution, all the gangways, and what standing room there may be at the back of the gallery were occupied, such was the crush to hear Prof Ernest Rutherford explain about radium. It seems quite possible that the working out of the consequences of the discovery of radio-activity will take as large a place in the scientific record of the first half of the twentieth century as the establishment of the theory of organic evolution has done in the last half of the nineteenth. Nevertheless the instant appreciation by the educated public that the discovery of radium is of great importance is a little puzzling. It offends no prejudices, threatens no dogmas, and its nature cannot even be comprehended without a certain amount of preliminary knowledge. Lastly it cannot be illustrated by striking experiments.—*From our issue of 26 May, 1904.*

An exhibition of "Grafton" pottery kilns, staged by Applied-Heat Co. Ltd., of Watford, in the London Electricity Board's showrooms at Erith, last week. The day before the exhibition, Mr W. H. Chapman, the company's chief designer, lectured students on the subject. The displays attracted considerable attention

About 50 Electrical Exhibitors at Scottish Fair

WHATEVER deficiencies the forthcoming Scottish Industries Exhibition might have, and they cannot be many, it certainly will not fail through lack of publicity. Apart from the normal posters and leaflets, the organising committee has done everything possible, by personal contact and through overseas organisations to gain the interest of buyers in all parts of the globe. The exhibition will take place in Glasgow's Kelvin Hall between 2 and 18 Sept. It is being sponsored by the Scottish Council (Development and Industry), financed entirely by Scottish people and organisations, and will be confined entirely to the display of goods manufactured in Scotland. Over 300 firms will be participating, representing about 100 different industries, of which the various electrical branches of industry are by no means least.

A quick glance through the catalogue reveals that there are nearly 50 companies within the electrical industry. Exhibitors in this field include manufacturers of generators, transformers, switchgear, cables, motors, boilers, instruments, lamps and all manner of domestic appliances. Such have been the requests for space that many firms have been rejected because there has been no further accommodation, and many have been asked to cut down the space applied for. We note too that the electricity supply industry is represented. The electricity stand is being organised jointly by the three Scottish Boards and E.D.A., and will depict the part played by electricity in the drive for increased productivity.

The previous Trade Fair organised in Scotland, took place in 1949. It attracted over 500,000 visitors, including 30,000 trade buyers, and resulted in orders being received for goods valued at over £10 million. It is confidently expected that these figures will be exceeded in 1954.

Objections to scrapping London's Trolleybuses

THE London and Home Counties Electric Traction Society has joined the many voices of protest against London Transport's decision to replace trolleybuses by diesel oil vehicles. In a statement issued last week the Society explains the majority of arguments against the proposal. It is pointed out that the economic life of a trolleybus is at least 1½ times that of a diesel bus, and the fixed equipment usable for many years. If the trolleybuses are abandoned, the Society states, much of the valuable apparatus will become redundant.

The statement goes on to point out the financial side of the changeover, showing how London's trolleybuses made a profit in 1952 against the oil buses' loss. Moreover, the same results were shown by similar provincial transport undertakings. One such undertaking, the Society recalls, recently published figures showing the considerable economies which could be made by operating the electric vehicles in preference to their oil counterparts.

Other arguments include the queriable wisdom of switching to imported fuel from the home generated power, and the addition to atmospheric pollution by use of diesel oil. The statement even quotes an extract from last month's *London Transport Magazine* praising the trolleybus. Finally the Society points out that at least 16 transport systems in Britain have extended trolleybus operation since 1945 or have powers to do so.

Electrical Apprentices awarded Rise in Pay

A GENERAL all-round increase in pay for apprentices in the electrical contracting industry has been agreed upon, to operate from 7 June. The agreement between the N.F.E.A. and the E.T.U. was reached at a recent special meeting of the N.J.I.C. Under this new agreement, the percentage rates are now related to the consolidated rate of the journeyman electrician at 15 years 20%, 16 years 25%, 17 years 30%, 18 years 45%, 19 years 55% and 20 years 70%. The revised rates for apprentices are:

Age	*Grade A*	*Grade B.*	*Mersey*
15	10d.	9d.	9½d.
16	1s. 0½d.	11½d.	11½d.
17	1s. 3½d.	1s. 1½d.	1s. 2d.
18	1s. 10½d.	1s. 8½d.	1s. 9d.
19	2s. 3½d.	2s. 1d.	2s. 1½d.
20	2s. 11½d.	2s. 7½d.	2s. 8½d.

There is also an increase in pay for Category 2 apprentices, ranging from 2d. at 15 years to 4½d. at 20 in grade B, and corresponding amounts in other regions.

Press told of N.-West's Progress and Plans for Rural Electrification

IN VIEW of the present mounting interest in rural electrification, the N. Western Electricity Board staged a Press tour of farms and agricultural undertakings in the Clitheroe area of Lancashire last week. The object was to demonstrate how electricity was helping to raise output and efficiency and assist in stemming the drift of manpower from the country. During the tour, the Board's chairman, Sir Joseph Hallsworth, said that last year the Board connected over 1,000 farms, an increase of 400 on the previous record set up in 1952, and the first time the number had reached four figures. In the current year £475,000 was to be spent on rural development, he said, and added that the Board wanted those working on the land to feel they were not neglected persons living in the backwoods. By next March power would have been taken to seven of every ten farms in the Board's area, compared with the national average of seven out of ten farms forecast by the B.E.A. for 1958.

As regards tariff changes, Sir Joseph said that despite increased overheads estimated at £750,000 this year, it was hoped to peg prices at existing levels by introducing further economies.

INTERNATIONAL MEETING

CONTINUING increase in the application of nickel-containing alloys provided an excellent subject for technical discussion at the Fifth International Gathering of the Driver-Harris Organisation. The conference took place at Alderley Edge, Cheshire. Two of the main causes of added demand have been the widening use of electronics in industry, and the more plentiful supply of new designs and specifications of instruments, resistors, and other electrical components. It was stated that the British Driver-Harris Co. was happily in a position to meet the demands on production. Latest additions at their Cheadle factory include several new wire shops and much new plant. Another new building is a modern two-storey research laboratory, almost complete.

Industrial Delegation reports on Burma

THE REPORT of the industrial delegation which spent a week in Burma towards the end of March has just published its report. The six-man team was led by Lord Burghley and included Mr. H. Nimmo, chairman of the Southern Electricity Board. There were no precise terms of reference, for the delegation went to study the Burmese Government's long-term plans of development and to see how British industry could best contribute to them. As regards the latter point, the mission states that there will be enormous demands for capital goods of all kinds, which U.K. manufacturers are well placed to provide. They point out that one of Burma's greatest problems is her limited availability of administrative, professional, technical and managerial personnel. They emphasise that it will be important to quote firm prices, to see that delivery dates are reasonably short and are honoured, and to ensure that we are willing to train Burmese to operate and maintain machinery.

As regards the country's development there are a number of programmes envisaged, but the most important is that still being prepared by Knappen-Tippetts-Abbett-McCarthy (K.T.A.M.), the U.S. consultants. Most important of these plans are seven power projects, involving schemes on the Pegu River, Saingdin Falls, Balu Chaung, a diesel electric system, the Myingyan power station, grid lines to connect up the main power stations, and finally distribution systems for diesel and hydro-electric stations. In addition there are irrigation projects, railway works, telecommunication extensions, and the establishment of many new industries, including the local manufacture of lampholders, switches, fuse boxes, cables, motors up to 1 h.p., small transformers, and possibly lamps.

To revert to the power projects, K.T.A.M. plans provide for a national grid system operating at 132 kV and 50 c/s, with a ring transmission system in the Delta, covering Rangoon, Pegu, Henzada, Tharrawaddy and other towns. K.T.A.M. proposals also cover a similar system from Mandalay, Myingyan, Meiktila and other centres. Hydro-electric surveys carried out in the 1920s, with which Mr Nimmo was personally concerned incidentally, are to be brought to fruition or extended. Three are under active consideration at present. At Saingdin Falls development could provide a maximum of 45,000 kW with an initial capacity of 30,000 kW. Detailed survey is being carried out. It is proposed to build a dam on the Pegu River, 43 miles north of Pegu. Two 15,000 kW sets would be installed initially, with provision for a third. Balu Chaung, near Loikaw, would be a comparatively simple site to develop a maximum of 14,000 kW, it is stated. There are also many other attractive potential water power sites.

A final point is that the delegation were at pains to correct the erroneous impression that British consultants only operated in certain limited fields.

The S.E. Scotland Electricity Board's stand at the Ideal Home Exhibition, held at Edinburgh's Waverley Market earlier this month. Organised on similar lines to the now famous exhibition held in London each year, there were numerous displays of electrical appliances. On the Electricity board's most attractive stand, we understand cookers and refrigerators received most attention from the public

NEWS IN BRIEF

It has been suggested to Newcastle-on-Tyne council that flats and other dwellings built on cleared slum areas should be provided with special fireplaces and other smokeless heating equipment at the outset, so as to make the areas smokeless zones.

Marconi's Wireless Telegraph Co. has received a large order to provide Canadian Overseas Telecommunications Corporation with specialised equipment for new long-distance radio transmitting and receiving stations at Vancouver.

A party of 15 U.S. journalists visited Ferranti Ltd., Hollinwood, recently, and toured the transformer, meter and installation departments.

Johnson and Phillips' Dramatic Group presented the comedy "While the Sun Shines," their 15th production, recently.

Viscount Brookeborough, Prime Minister of N. Ireland, and Lord Glentoran, Minister of Commerce, visited the Rugby works of the British Thomson-Houston Co. Ltd.

Report of the Council for the year ended 30 Apr. last has been published by the Association of Consulting Engineers.

Mines Rescue Superintendents from all parts of the country visited the Trafford Park works of Metropolitan-Vickers Electrical Co., Ltd., to see the manufacture of electrical equipment used in mines. The visitors were in Lancashire for their 4-day annual conference.

N. Western Electricity Board's newly-formed brass band gives its first public performance in Manchester on 19 June.

Junior Institution of Engineers offers for annual competition, the Durham Bursary valued at £20. Entrants are required to submit a written thesis on some engineering, technical or scientific subject. Further details may be had from the Institution's secretary.

In connection with our notes on H.M.Y. *Britannia* last week, we wish to make it clear that Wandleside Cable Works Ltd. supplied certain cable for use in the ship.

QUESTIONS IN PARLIAMENT

Nationalised Boards

A Royal Commission, before which evidence could be taken on oath with public sittings, was suggested by Sir W. Smithers to inquire into the costs of the nationalised Boards and to report on ways in which economies could be made. The Prime Minister replied saying that that method could hardly be the best means of investigation. Following the debate in the House last February, the Government were considering the next step to take. The House at that time discussed ways of increasing Parliament's opportunities to scrutinise the affairs of nationalised industries. Sir Waldron was also perturbed at members' inability to query the maladministration and waste of money on the part of those industries. The Prime Minister declined to reply and referred Sir Waldron to Mr P. Noel-Baker's assertion that the industries' annual reports contained full information on costs and other factors.

Classroom Illumination

AN unusual question regarding lighting in school classrooms was asked last week by Mr G. Longden. It appeared, however, that the questioner was concerned chiefly about the abstruse verbiage of the regulations concerning the level of illumination to be attained, which he was unable to fathom. The Minister assured him that architects and others engaged in building schools knew what the terms "luminous flux," "daylight factor," "lumen," and "candala," mentioned by Mr Longden, meant, and that in the majority of cases she was sure the regulations were fully carried out. Earlier, the Minister had told him it was the duty of local education authorities to see that the requirements of the Standards for School Premises 1954 were complied with and no officers of the Department were employed on that task. If exact measurements in particular schools were required, the Ministry contacted the building research station of D.S.I.R.

Orrin H.E. Project

FOLLOWING his recent detailed inquiries concerning new hydro-electric projects envisaged by the North of Scotland Hydro-Electric Board, Mr G. Nabarro turned his attention last week to the Orrin constructional scheme No. 29. Facts concerning this were given at question time by Mr Henderson Stewart. He said the expected load factor of the works embodied in the Orrin project was about 48% and that the anticipated saving in coal at a conversion figure of 1·31 lb of coal per unit of electricity generated was approximately 45,000 tons a year. The capital cost per MW installed was about £252,000. He had also been informed by the Board that if the cost of transmitting the power to the grid was added, that figure would be raised by about £6,000. Replying to further questions, Mr Stewart said it was hoped to start preliminary works on the scheme this year, the main works next year, and generate some power from it by 1960. He added that the project was approved by the B.E.A. which indicated that on the information available, the scheme appeared to be technically sound.

Ministry Staff

SOME details of staffing at the Ministry of Fuel and Power were given by Mr L. W. Joynson-Hicks in a written reply to Mr Renton, who asked why the Ministry's staff had risen from 2,459 to 2,487 in the last three months of 1953. It was explained that the size of the Department had been reduced by 38% since October, 1951, and reduction to a minimum number was constantly being sought. The stated increase of 38 was due to the engagement of temporary staff for seasonal work.

East-West Trade

A STATEMENT on the outcome of the three-power discussions on East-West trade would be made by the President of the Board of Trade as soon as he was in a position to do so, Mr D. Heathcoat Amory stated in a written answer. The discussions took place in March.

Cables Report

THE Minister of Supply's statement on the Monopolies Commission recommendations concerning wires and cables is dealt with on page 792.

London Trolleybuses

DECISION to scrap the vast majority of existing trolleybuses in the London area has aroused a deal of comment both inside and outside the House of Commons. A number of questions were put to the Minister of Transport again last week. One of the matters involved concerns the number of passengers carried. Mr Palmer queried this last Wednesday and the Minister stated that the passenger-carrying capacity would be the same whether the buses were powered by oil or electricity. Mr. Palmer was not satisfied, however, and pointed out that 200 extra vehicles would be needed instead of the 30 mentioned if calculations were based on the 70-seater trolleybuses and 64-seater diesel buses. He asked if action would be taken to restrain the L.T.E. in their bias against "this useful electric vehicle." Mr. Lennox-Boyd pointed out that the 70-seater 3-axle trolleybuses would be replaced by 2-axle vehicles of about the same seating capacity. He agreed with Mr E. Davies that considerable economy would be effected and that was the over-riding factor.

Earlier in the week, Mr G. Nabarro had called attention to the consumption and use of fuel, and its effect on the load factor of power stations. Mr L. W. Joynson-Hicks said about 28,000 tons of diesel oil will be needed above present consumption. There would be a negligible effect on load factor. Mr Nabarro then asked if it was judicious to turn from low-grade indigenous fuel burnt at power stations to imported fuel, but Mr Joynson-Hicks did not agree. The latter explained that nearly 50% of power used by London's trolleybuses were drawn from the L.T.E.'s own power stations, and it was for that reason, due to the demand on those plants by railway traction, that the load factor was actually improved by removal of the trolleybuses.

Mr Nabarro asserted his disagreement with the decision and stated his intention of raising the matter at a later date on the Adjournment.

Export Licenses to Russia

SOME details of the value and number of applications for export licences received by the Board of Trade for the export of electrical equipment to China and Russia in the past six months, were given by Mr D. Heathcoat Amory in a written answer on Friday. The information was sought by Mr G. H. C. Bing. The total number of applications in respect of Russia was 12, for goods valued at £3,056,989, and in respect of China, 72, valued at £468,775. Applications allowed for goods to be exported to Russia numbered nine including three applications worth £1 million for which no licence was required. These goods were worth £1,561,226. Two applications worth £7,115 were refused and two worth £1,488,648 are pending. As regards China, 38 applications were allowed for articles worth £139,380, 32 were refused for goods valued at £326,614, and two worth £2,781 were pending.

Sayings OF THE WEEK

"In some cases the prices quoted against us were so low as to leave no doubt that our (European and Japanese) competitors were either determined to buy themselves into markets, or were being subsidised, or both" . . . SIR ALEXANDER ROGER, chairman of British Insulated Callender's Cables Ltd., in his statement to shareholders.

"Anybody who is putting off investment in the belief that prices will be cheaper later on is living in a fool's paradise" . . . SIR HARRY PILKINGTON, speaking at the International Cotton Congress.

"Hire-purchase has come to stay and a lot of our industry is geared to it. We would have an unemployment problem which might surprise you without it" . . . LORD MACINTOSH, chairman, addressing the National Savings Assembly on Saturday.

COMPANY ACTIVITIES

INDICATIVE of the relaxation of caution about the payment of dividends, is the action of Mr M. H. W. Lancaster, the chairman of the Allen West group. Despite a fall in group trading profit from £1,053,000 to £986,200 he adds a 2½% bonus to a maintained 15% dividend. But like many other companies who are giving shareholders more, Mr Lancaster still keeps well within the margin of earnings. The net profit of £338,600 (£428,818) covers the dividend about 2½ times. Justifying the increase to shareholders, Mr Lancaster points out that the group's reserve strength and its liquid resources are strong. At end-January last, issued Ordinary capital totalled £1,170,000 against which were capital reserves of £131,000 and revenue reserves and surplus of £1,524,000. Of the current working capital of £2,635,000 no less than £1,172,000 was held in cash. Mr Lancaster reports a slight fall in sales, which confirms his forecast of last year. He adds, "this reduction does not appear to be progressive."

The position of British Insulated Callender's Cables Co. is an excellent example of the kind of thing which exporting groups in a highly competitive field are facing throughout the country. Quite suddenly last year International trading conditions came back to something approaching normal. Intense competition returned from Germany and Japan. This in turn keyed up American exporters in the electrical industries, too. What happened? Trading profits fell £1,178,000 to £8,344,000, an excellent result in view of the conditions prevailing.

Furthermore, it was more than made good by the tax cushion and higher special receipts. The year's net surplus was actually £534,000 higher at £3,998,000. The increase was mainly due to tax credits. What of the future? Unfortunately, Sir Alexander Roger, the chairman, who is 76 years old, has decided the time has come to retire. But before he goes he tells stockholders there has been a welcome increase in the intake of orders since last autumn. Competition is still keen. Low price, quick delivery, and credit terms are now just as necessary as first-class British workmanship.

In Sir Alexander's view the current year will not be easy, but he has great confidence in the team-work of the organisation he has built up over a period of 36 years, for 24 of which he has been chairman.

As chairman of Automatic Telephone and Electric Co., Sir Alexander Roger is aggrieved that the U.K. should still be deprived of an adequate telephone service. In his annual statement to shareholders he complained of Treasury restrictions on Post Office spending and suggested that the telephone service should be separated. Alternatively he suggested that the Post Office should be given powers to raise a public loan especially to finance the development and growth of the telephone system. He told shareholders that last year, had the orders been available, his company could have supplied more telephone equipment.—*From our City Correspondent.*

Aberdare Cables (Holdings) Ltd.

With buyers' stocks returning to about normal level, the home trade is working on a more even keel with reasonable orders, Mr. F. G. Penny, the chairman, reports. During the current year there has been a steady monthly improvement in the home order book compared with the previous twelve months, and a number of yearly contracts have been secured. Good orders have also been obtained from Australia, India and the Middle East, in addition to a £250,000 order from the U.S.S.R. South Wales Switchgear Ltd. also reports a larger order book which follows last year's record output.

Year to Oct. 31	£ Trading Profit	£ Net Profit	% on Ord. Earned	% on Ord. Paid	Ord. Price High	Ord. Price Low
1949	359,503	141,151	52	20	68/4	49/9
1950	263,633	76,092	28	20	16/11	13/–
1951	291,917	93,086	36	20	15/3	12/7
1952	424,743	160,985	51	25	15/–	10/3
1953	436,882	166,013	28	12½*	8/9	7/4

*Plus 100% capital bonus.

Automatic Telephone and Elect. Co. Ltd

Sales of telephone equipment overseas, although showing some reduction on 1952, have been maintained at a satisfactory level, Sir Alexander Roger, K.C.I.E., the chairman, states. Home sales, however, have again been limited by Treasury restriction, and Sir Alexander makes the suggestion that the telephone service be reconstituted as an autonomous public body on the lines of the B.E.A. The company's special signalling division is expanding, and orders have been received for the supervisory remote indication and control equipment for the B.E.A.'s 275 kV super-grid. The home subsidiary companies had another successful year, while overseas, the concerns are developing very satisfactorily.

Year to Dec. 31	£ Trading Profit	£ Net Profit*	% on Ord. Earned	% on Ord. Paid	Ord. Price High	Ord. Price Low
1949	1,385,101	627,779	85	12½	65/6	50/–
1950	1,664,229	741,507	100	15	63/3	51/6
1951	1,610,839	660,933	89	15	74/9	61/3
1952	1,260,137	539,505	52	15	62/2	50/3
1953	1,565,212	677,028	73	15	65/3	55/–

*Available for parent company.

British Insulated Callender's Cables

The lower turnover in 1953 was largely due to the abnormal shortage of orders in copper products last summer. It was only in the autumn that conditions started to become normal again, Sir Alexander Roger, the chairman, reports. The other major factor affecting business last year was the growth of competition particularly from European and Japanese firms. On the brighter side, excellent progress has been made on several large schemes of improvement. The company is shortly to embark on a large scale reorganisation of the Power Cables Production Division while other plans have been approved or are now under consideration to improve overall efficiency. Referring to overseas subsidiaries, Sir Alexander states that the expansion plans for the Indian Cable Co. are now coming into fruition and paper insulated power cables will be made in India for the first time. In colloboration with other concerns a factory has been established in Pakistan which should be in production towards the end of this year.

Year to Dec. 31	£ Trading Profit	£ Net Profit*	% on Ord. Earned	% on Ord. Paid	Ord. Price High	Ord. Price Low
1949	6,738,264	2,583,097	50	6⅞	36/3	28/7
1950	6,130,642	2,044,170	41	7½	35/7	29/6
1951	7,966,464	2,655,192	53	9	37/9	29/6
1952	9,522,076	3,069,756	44	10	34/1	24/4
1953	8,344,074	3,661,896	42	12½†	40/10	33/3

*Available for parent company.
†Including 2½% from realised capital profits.

Cape Asbestos Co. Ltd.

Although the group trading profit for 1953 at £1,038,963 is over £360,000 lower than that of the previous year, the dividend remains as before, a total of 25%, the final being 20%. The group net profit for the year is £246,828 (*£551,243*).

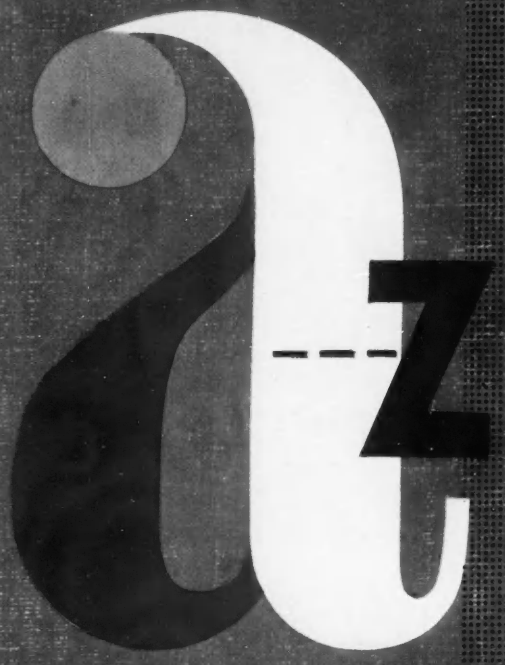
Ever Ready Co. (Gt. Britain) Ltd.

For the first time in the company's history the profit figure exceeded £1,000,000 for the year ended 28 Feb. last, Mr. E. N. Rowbotham, the chairman, states. But taxation, at £670,185 is also a record. Home sales have been well maintained and export turnover again shows a substantial increase over last year. Evidently the reductions in selling prices last year contributed materially to the expansion of the business and the profits, and Mr. Rowbotham considers the current trading year has started satisfactorily. It is proposed to capitalise £505,201 of reserves to be applied in paying up in full to Ordinary holders one Ordinary 5s. share for every two held, and to convert the 7% Cum. Participating Pref. stock into 10% Cum. Non-participating Pref. stock.

Year to Feb. 28	£ Trading Profit	£ Net Profit	% on Ord. Earned	% on Ord. Paid	Ord. Price High	Ord. Price Low
1950	687,106	310,809	54	35	32/3	26/3
1951	808,286	304,342	53	35	33/6	27/6
1952	972,368	359,363	66	35	27/9	20/9
1953	995,127	348,263	60	35	29/–	24/9
1954	1,237,669	406,807	70	40	29/6	26/–

Glenfield and Kennedy

It is proposed to proceed with the offer of 395,000 5½% Cumulative Preference £1 shares at 21s. 6d. each, to existing Preference and Ordinary holders. With this amount, the issued Preference capital will total £705,000 and it is anticipated that a further £295,000 of Preference capital will be issued shortly as con-



Aircraft Equipment
Booster Pumps
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Jigs, Fixtures & Gauges
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Mobile V.H.F. Equipment
Nyquist Diagram Plotters
Output Transformers
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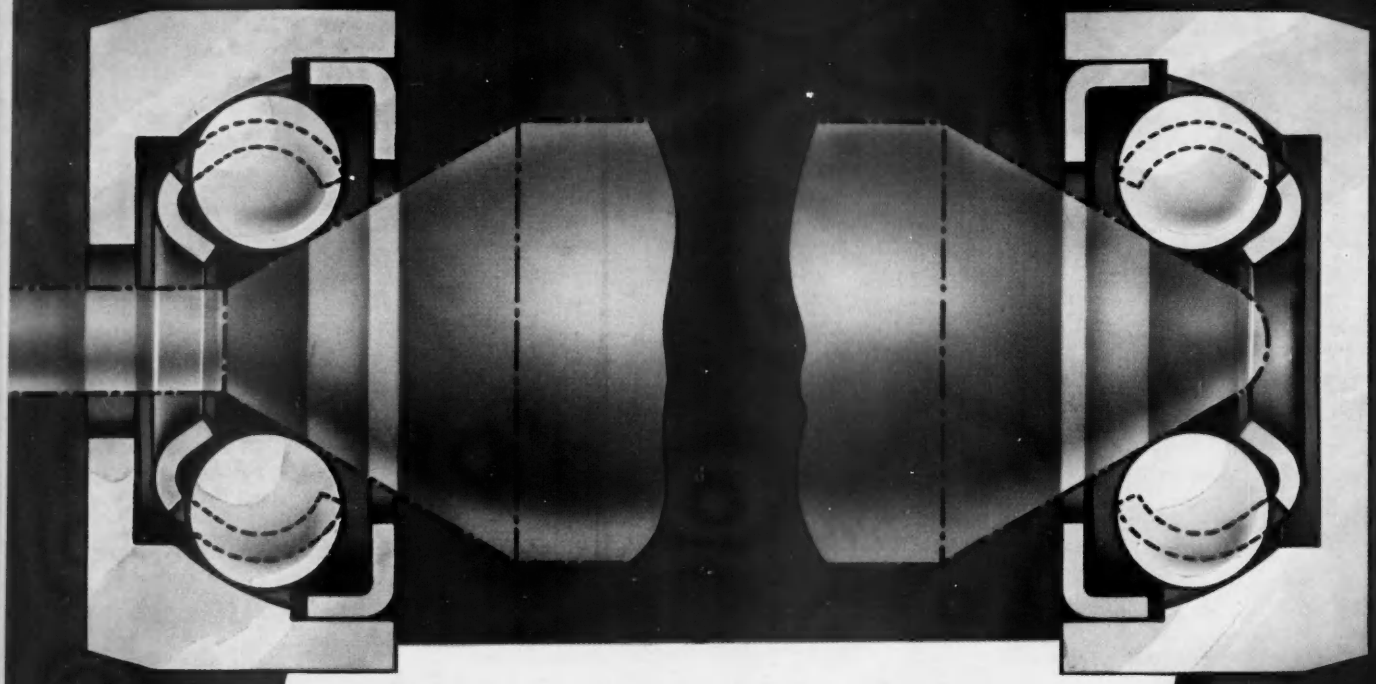


Register that trickle of current

Meters with bearings having appreciable static friction can miss a lot of revenue.

F.B.C. miniature ball bearings are now at the disposal of meter manufacturers in a range of sizes: they have extremely low starting and running friction.

The section above shows, enlarged 40 times, a bearing 2·5 mm. O.D. The simple straight tapers for the inner contact can be easily ground by the meter manufacturer on his own spindles, which can thus incorporate individual features needed in the instrument. The outer race has a spherical self-aligning track, so that some degree of error in the frame of the instrument is accommodated.

The sizes range from 1·5 mm. O.D. to 10 mm. O.D., and the open cup (see left above) will clear spindle extensions ranging from 0·25 to 2 mm. according to the size of bearing.

Fuller particulars and sizes are available on application.

SOME BEARINGS, ACTUAL SIZE

FISCHER BEARINGS COMPANY LIMITED, WOLVERHAMPTON

Fischer Bearings Company Ltd., and Timken-Fischer Stockists Ltd., Birmingham, are both subsidiaries of British Timken Ltd.

FBC TRADE MARK

ALL-BRITISH

F.B.C. :: FISCHER

BALL AND PARALLEL-ROLLER BEARINGS

sideration for the purchase of certain shares in subsidiaries at present held outside the group. Power has been reserved to create and issue a further 500,000 £1 Preference shares to rank *pari passu* with the £1 million 5½% Cumulative Preference stock.

Hall Telephone Accessories Ltd.

With increased orders during the second half of last year following considerable slackening of trade earlier, the company's order book is continuing to show expansion, Major O. M. Guest, the chairman, reports.

Johnson and Phillips Ltd.

The £100,000 reduction in the trading balance for 1953 compared with the previous year was entirely accounted for by the rubber cable business, where prices were reduced several times during the year, Mr G. Leslie Wates, J.P., chairman and joint managing director, has explained. The other departments have all done well and in the aggregate have increased their sales and profit figures over those of the previous year. Certain parts of the Charlton works are to be entirely reconstructed and the opportunity taken of extending and modernising that section of the cable shops. Regarding the Scottish group, Mr Wates reports that there was an improvement in the demand for electrical appliances late last year and as a result the firm's shops in Scotland are again fully occupied.

Reason Manufacturing Co. Ltd.

For the year ended 31 Jan. last, the profit is £4,158, compared with £4,156 for the previous year. The Ordinary dividend is again 1s. per 5s. share.

Sangamo Weston Ltd.

Contrary to expectations, instrument sales showed a considerable increase over the previous year, and the sales of other products, except meters, were well maintained, Mr S. B. Rogers, the chairman, states. But most of the increase in the instrument business occurred in the first six months of the year. The improvement anticipated in the meter business has not yet materialised but there is reason to believe that there should be an improvement in the second half of the year, he adds. If that proves to be correct, the total turnover should not be less than for 1953, but costs are rising and it is quite probable that the overall margin of profit will be lower. The proposal to increase the capital we referred to on 13 May.

Year to Dec. 31	£ Trading Profit	£ Net Profit	% on Ord. Earned	% on Ord. Paid	Ord. Price High	Ord. Price Low
1949	270,791	115,306	67	10*	22/3	20/4
1950	310,260	107,148	62	12½	24/-	21/-
1951	128,057	35,659	22	12½	28/3	22/3
1952	217,408	71,996	42	12½	25/9	19/7
1953	253,709	105,806	58	15	21/4	17/6

*Plus 100% capital bonus.

Telephone Manufacturing Co. Ltd.

The final dividend for 1953 is 7½% on the larger capital, again making a total of 10% for the year. The group net profit for the twelve months is £155,183 compared with £57,327 a year ago, after allowing for increased taxation.

West London and Provincial Electric and General Trust

Arrangements have been made privately for subscription at 98½% net of £100,000 4½% Second Debenture stock 1980-85. The chairman expects revenue for the current year will not be less than that of the year to 31 Mar. last.

Dividends Declared

Dewhurst & Partner. Interim of 4% (*same*).

Holophane Ltd. Interim of 7½% (*same*).

General Cable Manufacturing Co. Interim of 12% (*same*).

Plessey Co. Interim of 10% (*12½%*) but on doubled capital.

Electric Supply News

Ayr

The South West Scotland Electricity Board have approved a scheme, estimated to cost £9,156, for the reinforcement of supply in the Chalmers Rd district of Ayr. Two new 11 kV substations will be established, one at Carrick Pk and the other in Chalmers Rd. The existing substation in Carrick Rd will be dismantled.

Bedford

The Bedford district of the Eastern Electricity Board is proud of its record that 97% of the farms and farm cottages now have an electricity supply. Mr R. F. Barkham, the district manager, will agree that much of the credit is due to the progressive rural electrification policy carried out by the Bedford Corporation. In fact, some 80% of the farms and cottages were supplied by 1948. There are now only 19 farms in the district without a supply, and of these it is planned to connect 9, and 15 farm cottages in the current year if terms can be agreed with the owners.

Cardiganshire

It is the intention of the South Wales Electricity Board to complete the development of the whole of South Cardiganshire, so far as is practicable, within 15 years, the Cardiganshire County Council has been told. The Board have pointed out that there would always be a small residue of premises too remote from the mains to be connected up. Approximately £74,000 had been spent on detailed rural development in South Cardiganshire during 1953/54. In addition the Board have completed reinforcement work involving 33 kV lines to Blaenporth and Lampeter at a cost of £108,000. So far as the southern part of Cardiganshire was concerned, the completion of major schemes planned (stages 6—15) would result in the connection of 926 farms and 1,154 other premises. But after several members had commented on the time taken by the Board, it was decided to write to the Minister for Welsh affairs and to other M.P.s.

Midlands

The 100,000th consumer in the Central Gloucestershire sub-area of the Midlands Electricity Board was connected on Friday last. At vesting day there were 70,041 consumers in the sub-area.

New Lanark

Desiring to use up-to-date electrical appliances, the 600 villagers of New Lanark are to be connected to the South West Scotland Electricity Board's mains. For many years the villagers have been getting a supply from the water turbine plant of the Gourock Ropework Co. which also owns the houses. But as the voltage was not sufficient to operate modern appliances and radio sets, the company has agreed to re-wire the houses in the village without cost to the occupiers.

Northern Ireland

The Electricity Board for Northern Ireland has reduced the guarantee required of farmers. For capital expenditure on the part of the Board of £100 the guarantee becomes £16 instead of £17. The reduction has been announced by Mr Algeo, a member of the Electricity Board, who said that during the month of April 192 farms were connected, making 598 since January and a total of 8,564 since the Board took over.

Lighting Schemes

Darlington. The T.C. has received loan sanction for £9,600 for improving lighting in part of the Great North Rd.

Halifax. The Highways Committee is planning to install sodium lighting in place of existing gas and electric lamps on main thoroughfares. It is proposed to borrow £16,000 for the work in 1954-55.

Hastings. On the recommendation of the Parks Committee it has been decided to reconsider at a later date a scheme submitted by Thorn Electrical Industries Ltd. for illuminations in the White Rock gardens. The company offered to hire, install and maintain the equipment at a cost of £2,650 for 8 weeks, £2,800 for 10 weeks, and £3,000 for 12 weeks.

Ipswich. The Paving and Lighting Committee has recommended a £8,183 scheme to install sodium lighting along nine main roads.

Sunderland. The T.C. is to provide 52 lighting units in Chester Rd at a cost of £4,500; 67 units in Southwick Rd and North Hylton Rd at a cost of £5,400; and 20 units in Thompson Rd and Fulwell Rd, Southwick, at a cost of £1,610.

COMMERCIAL INFORMATION

Contracts Open at Home . . .

Dates given are the final for receipt of tenders unless otherwise stated.

28 May—Belfast T.C. Lighting and heating installation at Power Station West. —Advertised in 29 Apr. issue.

28 May—Chertsey U.D.C. Street lighting on three estates.—See 13 May issue.

28 May—N. Ireland. Installation at St. Luke's Hospital, Armagh.—See 20 May issue.

28 May—Southend-on-Sea. Installation at Westcliff high school, Eastwood Lane.—Advertised in 6 May issue.

28 May—Wortley R.D.C. Installation in 317 houses at Mortomley.—See 6 May issue.

29 May—Mitcham T.C. Group B street lighting along various roads.—See 6 May issue.

29 May—Newcastle-on-Tyne T.C. Installation in aged persons' hostel at Kenton. —See 13 May issue.

31 May—Bromley T.C. Wiring of 12 houses on 'Turpington estate. — See 20 May issue.

31 May—Bury St. Edmunds T.C. Sodium street lighting units with steel columns. —See 13 May issue.

31 May—Durham T.C. Street lighting in Sunderland Rd and in Margery Lane. —Advertised in 20 May issue.

31 May—Kilkenny T.C. Pumping plant and all accessories.—See 6 May issue.

31 May—Westmeath (Eire). Pumping plant for Tyrrelpass water supply.—See 6 May issue.

31 May—West Riding. Rewiring of Brighouse St. Martin's school.—See 13 May issue.

31 May—West Riding. Rewiring of Featherstone infants' and Wetherby St. James's C.E. schools.—See 20 May issue.

1 June—Keynsham U.D.C. Installation in 124 dwellings on Park West estate.—See 13 May issue.

1 June—Risca (Mon.) U.D.C. Street lighting columns, lanterns and fittings along about five miles.—See 13 May issue.

3 June—Co. Down. Installation in Newtownbreda school.—See 20 May issue.

3 June—Edinburgh T.C. Installation at Hyrot's Bank school.—See 20 May issue.

3 June—Northwich R.D.C. Electrical installation in houses, flats and bungalows in 1954 building programme. Engineer and Surveyor, J. B. Birtwistle, Whitehall, Hartford, Northwich.

5 June—Birmingham. Supply of electrically driven duplex pumps for Tame and Rea Drainage Board.—See 20 May issue.

5 June—Blackpool T.C. Supply of (a) one petrol motor driven 3-ton chassis for tower body; and (b) sectional tower body with power elevation fitted on chassis above. Illuminations and Public Street Lighting Officer, Electrical Dept., Rigby Rd East.—Advertised in this issue.

5 June—Dublin T.C. Fluorescent fittings for public lighting dept.—See 20 May issue.

5 June—Inverness. Lamps during year from 1 July for Craig Dunain Hospital. —See 20 May issue.

7 June—Ballymoney (Antrim). Electrical installations in administrative and other departments of Route Hospital, Ballymoney. Consulting engineers, W. and M. Given, 1 Waterside, Coleraine. Deposit £3. 3s.

7 June—Belfast. Insulation of pumping and heating equipment, and electrician's requisites for Royal Victoria Hospital, Belfast. Documents from Hospital's Purchasing Officer.

7 June—Wolverhampton T.C. Sodium, mercury and fluorescent street lighting.—Advertised in 13 May issue.

8 June—Holland. Installation in schools at Holbeach St. John's, Pinchbeck East, Wyberton, Weston Hills.—See 20 May issue.

8 June—Ryton-on-Tyne U.D.C. Installation of electricity in 218 houses. Surveyor, Council Offices.

8 June—St. Helens. Installation in Technical College.—Advertised in 20 May issue.

8 June—Sedgley U.D.C. Street lighting equipment for class A lighting along Himley Rd.—See 20 May issue.

9 June—Dundee T.C. Supply of concrete columns, lanterns, 140 W sodium lamps and ancillary gear. Public Lighting Engineer, 46 Dens Rd.

9 June—Maidstone T.C. Rewiring, etc., in 70 houses on Cherry Orchard estate. —See 6 May issue.

10 June—Belfast T.C. Extension to ash handling plant at Power Station West.—Advertised in 6 May issue.

10 June—Cheadle and Gatley U.D.C. Supply and erection in Adswood Rd of ten group A steel and one group B concrete columns, and erection only of six group B concrete columns. All to be equipped with lanterns and fittings supplied by council. Engineer and Surveyor, Town Hall, Burntwood, Cheadle. Deposit £2. 2s.

10 June—Crosby T.C. Supply and erection of 90 steel columns, lanterns, 140 W sodium lamps and ancillary equipment in class A between South Rd and Mersey Rd. Borough Engineer and Surveyor, Town Hall, Waterloo, Liverpool 22.

10 June—Preston T.C. Replacement of installation at Harris Library, Art Gallery and Museum.—Advertised in 13 May issue.

11 June—Portsmouth T.C. Electrically operated air conditioning and gas filtration plant at C.D. Main Control.—See 6 May issue.

12 June—Ashford (Kent) U.D.C. Supply and erection of 26 steel and concrete lighting columns with mercury discharge lanterns in group A. Surveyor, 5 North St. Deposit £1. 1s.

12 June—Cuckfield U.D.C. Street lighting schemes all in group B standard.—See 20 May issue.

12 June—Hucknall (Notts.) U.D.C. Rewiring of lighting circuits at public library, involving 47 points. Engineer and Surveyor, Council Offices.

12 June—West Hartlepool T.C. Supply of 800 steel lamp columns and swan-necks, and lanterns in class B with totally enclosed Perspex bowls. J. Stanley Miles, borough engineer, Municipal Buildings.

14 June—Sale T.C. Supply and fixing of stage lighting and wiring at town hall. Borough Engineer's Dept., Town Hall.

14 June—Sittingbourne and Milton U.D.C. Erection and installation of 48 250 W mercury vapour lamps, at mounting height of 25 ft, and 24 80 W mercury vapour lamps at 15 ft, for street lighting at various points. Engineer and Surveyor, Central Ave, Sittingbourne. Deposit £3. 3s.—Advertised in this issue.

14 June—West Riding. Rewiring of Heckmondwike secondary modern school, Rothwell Mickletown junior modern and infants' school, and Rothwell Stourton J.M. and I. school. County Architect, Bishopgarth, Westfield Rd, Wakefield. Deposit £2. 2s.

14 June—Woodbridge (Suff.) U.D.C. Supply of multi-stage submersible electric motor pump, 3-phase, 50 cycles, 415 V,

Your Queries Answered

Readers are invited to make use of our free enquiry department which possesses wide resources including an index of trade information with over 100,000 entries

A Selection from the 118 queries answered this week

"Kingston" electric lamps, makers of? H.T.G.—Kingston Lamp Co., Ltd., 6/12 New Cleveland St, Hull.

"Li-Lo" inflatable rubber balls, makers of? J.D.S.—B. P. Cow and Co., Ltd., Factory Sq, Streatham Common, S.W.16.

"Golden Arrow" appliances, suppliers of? J. Toubkin, Faraday House, Todd St, Manchester 3.

"Rotaflex" lighting fittings, suppliers of? T.B.C.—Rotaflex (Gt. Britain) Ltd., 90 Regency St, S.W.1.

"Ladybird" lawnmowers, makers of? P.S.—A.M.I. Lawnmower Co., Ltd., Elmbrook Mill, Reading Rd, Wokingham, Berks.

"New Reform" well glass lighting fittings, makers of? F.B.C.—These are made by Watertight Fittings Ltd., 4/10 Newbold Rd, Chesterfield, in association with Simon Handling Engineers Ltd., Cheadle Heath, Stockport, Cheshire.

"Powermaster" oil-fired boilers, makers of? K.S.C.—G.W.B. Electric Furnaces Ltd., Dibdale Works, Dudley, Worcs.

"Connor" washing machines, agents for? Y.E.B.—Sterling Eng. Co., Ltd., Sterling Works, Dagenham.

with fully automatic starter and fittings, etc. Water Engineer, Waterworks, Bredfield Rd.

15 June—N. Cotswold R.D.C. Wiring and supply of fittings for 13 houses at Ebrington and two at Clapton-on-the-Hill. Surveyor, Council Offices, Moreton-in-Marsh.

16 June—Manchester T.C. Two centrifugal pumps and other gear at Haweswater.—See 20 May issue.

16 June—Manchester T.C. Electrical installations in 250 and 147 houses on Langley estate. Director of Housing, Town Hall. Deposit £1. 1s.—Advertised in this issue.

17 June—Belfast. Electrical installation in new voluntary intermediate school in Whiterock Rd. Consulting engineer, A. W. Gordon Holt, 74 South Parade, Belfast. Deposit £3. 3s.

19 June—Swinton and Pendlebury T.C. Wiring and supply of fittings to 48 houses and 32 flats on Clifton estate. Borough Engineer, Town Hall, Swinton.—Advertised in this issue.

21 June—Ossett T.C. Supply of group A lighting in Bank and Dale Sts, and Market Place, including 42 concrete columns 25 ft high and two 15 ft high. Borough Surveyor, Town Hall.

21 June—Southall T.C. Supply of (a) 45 140 W sodium vapour discharge lamps, capacitors and transformers; and (b) 45 concrete columns (25 ft) with installation of all equipment. Borough Engineer, Town Hall. Deposit £2. 2s.—Advertised in this issue.

22 June—Keswick (Cumb.) U.D.C. Supply and installation in Main St, of 37 fluorescent lighting units each comprising 25 ft concrete or steel columns, control gear and lantern containing three 5 ft 80 W tubes in group A. Surveyor, R. Lusher, Council Offices. 50 Main St.—Advertised in this issue.

24 June—Belfast T.C. Private automatic telephone system at Power Station West.—Advertised in 20 May issue.

No date stated—Bristol. Electrical stores during 1954-55 for Cossham and Frenchay Hospital.—See 20 May issue.

No date stated—N. of Scotland H.E. Board. Construction of 11 kV and l.v. wood pole o.h. lines in the Glen Esk and Glen Clora areas. Kennedy and Donkin, consulting engineers, 3 N. Charlotte St, Edinburgh. Deposit £2. 2s.—Advertised in this issue.

No date stated—C. Tyrone. Electrical installation at Hutton primary school, Beragh. Chief Education Officer, Education Offices, Omagh. Deposit £3 3s.

. . . and Overseas

*Details of items marked * may be obtained on application to the Board of Trade, Lacon House, Theobalds Rd, W.C.1, quoting reference.*

10 June—British E. Africa. Kampala Municipal Council inviting tenders for various items of street lighting equipment. Town Engineer's Department, Sixth St. B.o.T. (Ref.: ESB 12679/54).*

14 June—India. Total of 327 distribution transformers to various specifications required by Madras Electricity Department. Specif. No. E221. Superintending Engineer, Technical (Electrical), 157 Mount Rd, Madras. B.o.T. (Ref.: ESB 12393/54).*

14 June—Turkey. Supply of 3 million metres of 1 mm. rubber insulated copper wire, and 1½ million metres of 4·5 mm. same for Posts, Telephone and Telegraphs Dept., Ankara. B.o.T. (Ref.: ESB 12565/54).*

21 June—India. Supply of conductors, ground wire and feeder earthing sets for 348 route miles of 132 kV double circuit transmission lines. Specif. No. E.D.702-1. Chief Electrical Engineer, Damodar Valley Corporation, Anderson Hse, Calcutta 27. B.o.T. (Ref.: ESB 12787/54).*

23 June—South Africa. Supply of 1,000 ft of ·25 sq in., 4-core l.t. paper insulated, lead covered, double steel tape armoured, anti-electrolysis and served cable, for Stores Dept. of S. African Railway. Tender No. C.7900. Chief Stores Superintendent, P.O. Box 8617, Johannesburg. B.o.T. (Ref.: ESB 1295/54).*

24 June—South Africa. Stores Department, S. African Railways, invite tenders (No. F6857) for supply of total of 158,900 ft of electric cable for motor vehicles. B.o.T. (Ref.: ESB 12803/54).*

15 July—Australia. Western Australia Govt., Murray St, Perth, calling for two tenders (Nos. 143a and 144a) for supply of switchgear. Documents available from Agent-General, 115 Strand, London, W.C.2.

July—Australia. Supply, testing, etc., of 3 electrically driven circulating water pumps with motors, for steam turbine condenser, etc., cooling water system proposed for Bunbury power station of State Electricity Commission of Western Australia. (Schedule No. 192A 1954.) B.o.T. (Ref.: ESB 12687/54).*

3 Aug.—Philippines. Supply of hydraulic turbine, governor and inlet valve, generator, power transformer and substation service equipment for Lake Buhi-Barit hydro-electric river project No. 1, Camarines Sur, Luzon. B.o.T. (Ref.: ESB 12953/54).*

PRICES of cable metals and other materials

Figures quoted are the official prices ruling on Tuesday, 25 May

	£ per ton	Weekly change £	Price last year £
COPPER, standard class A (settlement)	241½	−⅝	253
„ (3 months)	238	−½	—
LEAD, refined pig, min. 99·97% purity (cash)	95	+⅛	82½
„ (3 months)	94½	+⅜	87½
TIN, refined, min. 99·75% purity (settlement)	728	+5½	733½
„ (3 months)	727	+6	731½
ALUMINIUM, ingots 99·99·5%	150	—	161
ZINC, virgin, min. 98% purity (cash)	79½	+⅛	70½
„ (3 months)	79⅜	+⅜	70⅜
RUBBER No. 1, RSS. spot (per lb.)	18⅝d.	−⅛d.	21d.
„ c.i.f. basis, ports. August (per lb.)	18⅛d.	−1/16d.	20⅜d.
ARMOURING:			
Galv. Steel Wire (0·104 in.)	51	—	50½
Mild Steel Tape (0·014 in.)	40	—	40

TRADE MARKS

This information is extracted from the Official Journal by permission of the Controller.

Minelec. 727,536 Class 9. Wireless and television sets, Minelec Ltd., 38/39 Bruton St, W.1.

Cuproflexend. B724,249. Class 9. Electrodes containing copper. Rockweld Ltd., Commerce Way, Croydon.

Gaggia. B725,062. Class 9. Coffee percolators, domestic coffee grinders, etc. Brevetti Gaggia Societa a Responsabilita Limitada, via Cadolini 24, Milan, Italy.

Gazette Announcements

COMPANIES ACTS

Edolite Lamps Ltd. Meetings of creditors and contributors will take place at Official Receiver's Office, 20 Byrom St., Manchester, on 1 June at 2 p.m. and 2.30 p.m. respectively.

W.E.K. (Electrical) Ltd. Petition for winding-up presented on 29 April and order made on 17 May.

Ranalagh Ltd. First dividends of 15s. in £ payable at offices of liquidator, Torquil J. M. Macleod, 4 Bucklersbury, London, E.C.4, on 21 June.

BANKRUPTCY ACTS

Release of Trustees

Leeds. Leonard Peel, electrical engineer, trading at 216 Low Lane, Horsforth, Leeds. Trustee was W. H. Meredith, Official Receiver, 29 East Parade, Leeds.

Sheffield. Arthur S. Bennett, electrical contractor trading at South View, Webb's Ave, Stannington. J. B. G. Moore, Official Receiver, 55 Queen St, Sheffield, was trustee.

Intended Dividends

Boston. Leslie J. Anthony, trading in partnership as Dolphin Electric Co at 6 Dolphin Lane, Boston. Last day for receiving proofs, 1 June. Trustee is C. G. Compton, inc. acc., 2 New St, Boston.

First Meeting

Tunbridge Wells. Jack C. R. Gillitt, electrical contractor of 19 Stangrove Rd, Edenbridge. First meeting will take place tomorrow (Fri.) at Official Receiver's Office, 8 Old Steine, Brighton, 11 a.m., and public examination at Court House, Crescent Rd, Tunbridge Wells, on 7 July at 11 a.m.

Dividends

Bangor. David L. Smith, electrical contractor trading at Midland Bank Chambers, Cefn Rd, Old Colwyn, Denbigh. Supplemental dividends of 10s. 4d. in £ payable at 5 Rumford Pl, Liverpool, on 14 June.

Contracts Placed

Whickham (Dur.) U.D.C. Wiring of 171 council houses, T. W. Steanson.

London. Manufacture, supply, etc., of two electric lifts at Sydenham secondary school, Bennie Lifts Ltd., £7,640.

Dudley T.C. Street lamps and equipment for Tansley Hill and Sledmere, Revo Electric Co. Ltd., £2,981.

Maidstone T.C. Wiring of 88 flats on Shepway estate, Electrical Refrigeration Co. Ltd., £1,813.

BUSINESS PROSPECTS

Home

Alloa. New factory to be built on Alloa-Tullibody Rd by Donaldson Bros, Hallpark Mills.

Argyllshire. Construction of 38 houses at Strachur, 10 at Kames and 4 each at Furnace and Innellan. County Architect, County Offices, Dunoon.

Beverley R.D.C. Construction of 100 houses in Welton Rd, Brough. Architect and Surveyor, G. Palfreyman, 22 Lairgate.

MEETINGS TO NOTE

THURSDAY, 27 MAY

I.E.E. (London). — "Development and Utilisation of Hydro-Electric Power in Uganda," J. M. Stock and J. C. Lithgow. Savoy Place, W.C.2, 5.30 p.m.

FRIDAY, 28 MAY

I.E.E. (London Utilisation).—Summer visit.

MONDAY, 31 MAY

I.E.E. (Western).—39th annual meeting at Uskmouth power station, Newport. Inspection of power station at 2 p.m. followed by meeting.

TUESDAY, 1 JUNE

INCORP. PLANT ENGINEERS (London).—"Use of Welding in Plant Repair and Reclamation," J. Stafford. Royal Society of Arts, W.C.2, 7 p.m.

TUESDAY, 8 JUNE

INCORP. PLANT ENGINEERS (Manchester).—"Peak Loads and Heat Storage," W. Goldstern. Engineers' Club, Albert Sq, 7.15 p.m.

TRADE NOTES

Change of Address. As from 27 May, the Glasgow office of A. Reyrolle and Co. Ltd. has moved from 45 Hope Street, to 20 Woodlands Ter, Glasgow, C.3, from which address the Scottish area manager, Mr W. G. Martin will operate. The new telephone number is Douglas 3993/4.

Change of Name. The title of Spuncast Ltd. has been changed to Spunalloys Ltd. Their address remains, Imperial Works, Watery Lane, Birmingham 9.

The name of the parent company of the Brush Group has now been changed to The Brush Group, Ltd., from The Brush Electrical Engineering Co., Ltd. The name Brush Electrical Engineering Co., Ltd., has been given to the Group's subsidiary company managing the factory at Loughborough.

Leeds Office. Pyrotenax Ltd. have opened a new branch office at 19/21 Cabinet Cham, Lower Basinghall St, Leeds 1. (Telephone No. Leeds 27826). The new office, which is under the management of Mr W. Cameron, will have a fully equipped demonstration and instruction department where instruction and technical information on the use of Pyrotenax cables can be obtained.

Agents. Thermodare Ltd., have appointed Mr C. A. Carr, ASSOC.I.E.E., of La Rocque, Cranleigh Ave, Rottingdean, Sussex, as agent for south-east England, and Mr A. J. Mare, B.SC.(Eng). A.M.I.E.E. as their Midlands and Eastern agent.

Brierley Hill (Staffs.). Mineral water factory proposed at Silver End by Hickman and Son (Brierley Hill) Ltd.

Crawley (Sussex). Architect for factory proposed by Triefus and Co., Ltd., is A. Vernon, 21 Catherine Place, London, S.W.1.

Derby. Factories to be built on Osmaston Park industrial estate for Wild and Brown Ltd., Moss St, and at Raynesway by Seymour's Castwell Foundry Ltd.

Durham. It is proposed to carry out electrical alterations at Bowburn school, £1,100; Seaham Harbour Deneside School, £2,250; Sedgefield school, £900; Trindon Grange school, £900; Washington Biddick school, £1,000; Hebburn R.C. Aided school, £1,500; Annfield Plain school, £2,150; and nine other schools.

Gateshead. J. G. Cowe and Son, Central Chambers, Chester-le-Street, are architects for factory extensions on Team Valley estate for Anglo-Scottish Tool Co. Ltd.

Hornchurch. Planning approval received by S. C. Brice, 10 Meadway, Romford, for proposed factory and offices at Rainham.

Hornsey T.C. Construction of 34 flats in Boyton Rd. Borough Engineer and Surveyor, Town Hall, N.8.

Maidstone T.C. Erection of 112 flats on Shepway Farm estate. Borough Surveyor, Palace Ave.

Mitcham (Sur.). G. B. A. Williams, 40 Great Ormond St, W.C.1, is architect for erection of factory in Willow Lane for Coloquid Cellulose Ltd.

N. Ireland. Erection of next stage of General Hospital at Londonderry. Secretary, N.I. Hospitals Authority, 44-46 Queen St, Belfast.

Northants. Sketch plans approved for secondary school at Roade.

Plymouth T.C. Erection of 24 flats in King St. H. J. W. Stirling, City Architect, Seymour Rd.

Scotland. Erection of 50 dwellings on Kirkhall site, Ardrossan. Scottish Special Housing Association, 15-21 Palmerston Pl, Edinburgh.

Scunthorpe. County Council to build Westcliff Gardens secondary modern school at cost of about £200,248.

Seaton Valley (Northumb.) U.D.C. Tenders may soon be invited for installation of electricity in council houses at Seghill.

Slough T.C. Erection of 8 shops with maisonettes over on Wexham estate. Borough Engineer, Town Hall.

South Shields T.C. It is proposed to erect another 12 shops on Simonside estate.

Southport T.C. Erection of 46 houses and 8 two-storey flats on Radnor Drive estate. Borough Architect and Town Planning Officers' Dept., 93-105 Lord St.

Sunderland. Bus station and garage costing about £75,000 to be built in Park Lane by Northern General Transport Co., Ltd.

Twickenham. Grundy (Teddington) Ltd. propose to build offices and additional factory premises at their works at Hampton Hill.

Wilmslow U.D.C. It is proposed to erect 106 houses at Lacy Green. Site works are out to tender. Engineer and Surveyor, Council Offices, Green Hall.

Wisbech (Camb.) T.C. Scheme in hand for 88 houses and flats, 52 houses and 12 other dwellings on Tinker's Drove estate.

Overseas

Portugal. A. Raposo and Morais Lda., of Praca da Liberdade, 114-40 Sala T, Oporto, are interested in taking on representation of U.K. manufacturers of electric refrigerators.

U.S.A. Western Regional Sales, 1919 N.W. Thurman, Portland, require U.K. made submersible motors. Types wanted are f.h.p. units from ¼ to 5 h.p. in single phase from 220 V supply, and ¼ and ½ h.p. units for 110 V operation.

Also, electronic products and component parts sought by Jim and Dave Packard, 770 M. and M. Building, Houston, Texas. Mr. Dave Packard is to visit U.K. next month, and literature is wanted before he leaves.

West Indies. Electrical accessories and fans are among items for which Mr Geoffrey A. George, director of George and Branday Ltd., 58 Port Royal St, Kingston, wishes to gain representation of U.K. manufacturers. Further details of items from B.o.T. (Ref.: ESB 6527/54).

NEW COMPANIES

Extracted from the Register issued by Jordan and Sons, Ltd., 116 Chancery Lane, W.C.2.

Nicholl and Wood Ltd., Devon Works, Dunkirk La, Halifax. To take over business of machinists and chaplet makers carried on as "Nicholl and Wood," at Dunkirk La, Halifax, and mechanical, motor, electrical, oil fuel, constructional, marine, civil and consulting engineers, etc. Nom. cap.: £10,000. Permt. dirs.: J. Nicholl and R. Wood.

Consolidated Concessionaires Ltd., 11 Peter St, Manchester 2. Representatives of and general agents, brokers and trustees for civil, electrical and general engineers, building and public works contractors, etc. Nom. cap.: £1,000. Dirs.: Maj. H. M. Kennedy, H. Kingsley and Mrs M. Orme.

W. S. Products Ltd., 214, Norwood Rd, Tulse Hill, S.E.27. General merchants, wholesalers and retailers, commission and general agents in the manufacture of electrical and mechanical goods and appliances, metal goods, fabrics, clothing, etc. Nom. cap.: £100. Permt. dirs.: W. Steers and Ada V. Tidmarsh.

Nicotron Developments Ltd., 35 Copthall Av, E.C.2. Scientists, to develop, market and exploit inventions and patents and secret processes relating to electrical, mechanical and electronic and all other sciences and all the engineering processes and technologies connected therewith, etc. Nom. cap.: £1,000. Dirs.: N. S. Japolsky, J. M. Japp and Mrs D. E. Tattersall.

Phototronics (London) Ltd., 43 Upper Berkeley St, W.1. Manufacturers of and dealers in electrical, mechanical, cinematographic, photographic, wireless, television and radio apparatus, equipment and accessories, etc. Nom. cap.: £100. Dirs.: W. G. Clark and Dr. F. Klement.

(Continued on following page)

Norvac Electrics Ltd., 109 Oxford Rd, Manchester 1. To take over business of electrical appliance dealers carried on by "Norvac Electrics" at Manchester. Nom. cap.: £10,000. Dirs.: H. Morris and I. Morris.

S. J. Holmes and Co., Ltd., 225 Chingford Mount Rd, E.4. Manufacturers of and dealers in electrical apparatus, furniture, etc. Nom. cap.: £5,000. Dirs.: S. J. Holmes and Mrs. M. B. Holmes.

Anchor Cable Co., Ltd., Norfolk Hse, Norfolk St, W.C.2. Manufacturers of and dealers in all kinds of insulated cables and wires, etc. Nom. cap.: £2. Dirs.: J. P. Hourston and W. H. Wells.

LONDON ELECTRIC WIRE AND SMITHS

SALES RECOVERY

THE forty-fifth annual general meeting of The London Electric Wire Company and Smiths, Ltd, was held on May 25 in London.

Mr A. Noel Smith, chairman, in the course of his speech, said:—The Balance Profit for the year at £1,076,520 is down by £230,590 as compared with 1952 excluding Profits on realisation of investments, which are increased. Last year in his speech the chairman indicated that there was a falling demand towards the end of 1952 and the setback continued well into 1953. Towards the latter part of the year there was a slow recovery, but the volume of sales for the whole year was lower than in 1952. Apart from the demand in respect of one subsidiary, I am happy to say that the recovery has been maintained during the first few months of 1954 and I hope this trend will continue.

The charge for taxation on the 1953 Profits is considerably lower than for the previous year, but it still represents approximately 50 per cent. of the profits earned. After deducting Taxation there remains a net profit for the year of £536,395, which is £25,815 higher than for 1952. This net profit together with the balance brought forward from the previous year leaves a sum available for Reserves and Dividends of £1,025,216.

An interim dividend of 5 per cent. was paid last October on the £1,000,000 Ordinary Stock then issued and the final dividend of 7½ per cent. which the Board recommend should now be paid will bring the total dividend for the year up to the equivalent of 10 per cent. on the £2,000,000 Ordinary Stock now issued. Your Board, in considering the question of the final dividend on the increased Ordinary Capital feel that they are justified in recommending a larger distribution than in previous years.

Sales

The long anticipation of a substantial fall in the price of Copper resulted in our customers restricting their orders and only buying from hand to mouth. This position still persists, although since the Copper market reopened, there has been a slow but steady recovery in orders received, right up to the end of the year, and indeed, up to date. These changed conditions have had to be met by modifications in methods and outlook both in our factories and sales organisation.

In the technical field, too, the changed conditions arising from a "buyers' market" have called for a new and intensified effort.

The Future

I know that you will wish me to say something about the future, however difficult this may be under present conditions. You would like to know that all your company's factories are equipped with the most up-to-date plant and methods of manufacture and it is to achieve this position that we have spent large sums of money. The new Rolling Mill at our Trafford Park Works—which is one of the finest in the world—will shortly be coming into production. The Mill is of new design and while capable of high outputs, has been planned with a special view to producing a rod of much better quality than has been possible in the past.

It is disheartening to find that our efforts to keep down costs of production are defeated by frequent increases in costs of services, such as coal, gas, electricity and transport. This instability in costs and its effect on selling prices makes the task of competing in overseas markets extremely difficult.

Increasing competition is experienced in overseas markets where we have many Branches and Agencies. Last year our direct sales in export markets showed a moderate increase as compared with the previous year, in spite of growing competition.

The report was adopted.

THE BRUSH GROUP LIMITED

(Formerly Brush Electrical Engineering Co., Ltd.)

Sir Ronald W. Matthews on Improved Trend of Trading

THE sixty-fifth annual general meeting of The Brush Electrical Engineering Company, Ltd., was held on May 20th at Winchester House, Old Broad St, London, E.C.2.

Sir Ronald W. Matthews, D.L., M.INST.T. (the chairman), presided.

The following is an extract from the Chairman's statement which had been circulated with the report and accounts:

During recent months we have adopted for Group publicity purposes the title "The Brush Group." The significance of the former title, the "BRUSH ABOE GROUP" was frequently misunderstood and your Board has considered it desirable that a simpler title should be adopted. As you will have seen from the Notice of the Annual General Meeting, the Board are now recommending that the name of the Company should be changed to "THE BRUSH GROUP LIMITED." Assuming this is agreed, the title of the Brush Electrical Engineering Company Limited will be immediately passed to a subsidiary company which we shall employ to manage the Loughborough Works.

Manufacturing

In the course of his review of the Group's widespread manufacturing activities, the chairman said:

The Loughborough factory has had another successful year. The Turbine Reconstruction Programme for the British Electricity Authority is complete. All the reconstructed machines are running satisfactorily. Our turbine testing facilities have been improved by the provision of a new overspeed pit equipped with balancing machinery of the latest type.

Our range of alternators has been improved by the introduction of the Amplidex system of voltage control invented and developed by members of our engineering staff. Our range of flameproof motors has been expanded to 150 b.h.p. Facilities for testing rotating electrical machines have been enhanced by the installation of a completely new test bed for direct current machines, including traction motors and generators, and an additional new test bed for large and medium size alternators.

A new 250 MVA switch-fuse unit for voltages up to 11 kV has been developed. An entirely new layout of plant for switchgear manufacture has been completed giving us a modern well-equipped switchgear factory which has excited favourable comment.

Brush Bagnall Traction Limited has delivered five pilot main-line locomotives for the Ceylon Government Railway for trial purposes and these have run nearly 400,000 miles in normal commercial service. Instructions to proceed with the remaining twenty locomotives on this contract have now been received. Reports from Ceylon tell us that the locomotives are easy to drive, ride steadily and can handle the rated loads with power in hand. They have amply demonstrated the economies resulting from the replacement of steam by Diesel-electric traction. Contracts for shunting locomotives for the Steel Company of Wales and the National Coal Board are proceeding satisfactorily.

The Cardiff Factory of Hopkinson Electric Company Limited is now under new management, independent of the Loughborough Works. A range of "square path" alternators involving a radical change in design, has been developed and marketed during 1953. Reception has been favourable and the new alternator is now in active production. Other developments include fan-cooled squirrel-cage induction motors and a range of high-rupturing capacity fuse links.

The success of the new Mirrlees range of engines has been remarkable: particularly that of the largest unit, an engine of 3,000 b.h.p. One of the major features of this outstanding engine is its low fuel consumption. Orders for these engines have been received from B.E.A. and many other electricity undertakings throughout the world. In the "J" range the 100th engine for the Admiralty defence contract was despatched from the factory at the end of 1953.

We have entered the New Year with a not unhealthy order book, and with satisfactory prospects in most of our traditional markets and others that we are vigorously assaulting. The urge towards the development of the backward areas of the world grows stronger day by day, and The Brush Group is in every way armed to play its full part in that essential task. Our sales organisation is healthy and alert, our factories well managed and excellently equipped.

The report and accounts were adopted and the proposed change of name to "THE BRUSH GROUP LIMITED" was approved.

BRITISH INSULATED CALLENDER'S CABLES

GROUP ASSETS OVER £62,000,000

Sir Alexander Roger on the Satisfactory Results

THE 9th annual general meeting of British Insulated Callender's Cables Ltd. will be held on 10 June in Liverpool.

The following is an extract from the circulated statement of the chairman, Sir Alexander Roger, K.C.I.E.:

The directors deeply regret to record the loss, through death last July, of Sir Johnstone Wright who, after a lifetime of service in the electricity supply industry, joined the board of this company in 1948. His friendship and wise counsel are greatly missed by us all.

In my statement last year I expressed the opinion that trading conditions in 1952 had been exceptionally favourable and the drop in 1953 Trading Profit of £1,178,002 to £8,344,074 was not unexpected by us.

Under all the circumstances we consider the results, which are more in line with the normal year 1951, to be satisfactory.

The main features of the Profit and Loss Account are that the fall in Trading Profit has been more than offset by the decreased charge for Taxation and the increased Special Receipts leaving Net Available Profit from the year £533,901 higher at £3,998,336.

Your directors have had fully in mind the claims of Stockholders for an increased distribution. Thus, while continuing to strengthen reserves by transferring £500,000 to Reserve for Replacement of Fixed Assets, and £1,000,000 to General Reserve; and by adding £322,346 to the Balance Carried Forward on Profit and Loss Account, they propose to pay a total dividend for the year of 10% less Income Tax (of which 2½%, less Income Tax, has already been paid as an interim dividend last January) and to make Special Distribution of 2½% free of Income Tax out of Capital Profits earned on the realisation of investments and properties in 1953 and earlier years.

Production

1953 has not been an easy year for our Production people. In certain of our activities the Group has enjoyed a good load factor with all its benefits, but in others the load has been erratic with all its consequent problems. This latter position has applied particularly where copper is mainly involved.

In addition we have had such abnormal experiences as the flooding of our Erith Works, and an explosion last August in our copper refinery after 22 years of trouble-free operation. Fortunately no loss of life occurred in either case.

In some of our activities turnover was increased and on others well maintained, but in our Copper Wire Mill products and in Power Cables substantial reductions were experienced. Admittedly some falling away from previous levels was to be expected, but in the summer of last year there was an abnormal shortage of orders in copper products when it became known that the London Metal Exchange was re-opening in August.

The other main factor affecting business in 1953 was the growth of competition particularly from European and Japanese firms in overseas markets.

Technically, I believe that in our industry we are as efficient as anyone in the world and we are spending large sums each year to remain so.

An extensive programme of research and development work commenced some years ago has enabled the company to produce new forms of mineral insulated cable, and arrangements for commercial production are nearing completion.

Our position as suppliers of type approved aircraft cables has been consolidated by the addition of "Nypren" to the widely used "Pren" cable range.

Another important development has been the marketing of "Unifire" cables which are used for aircraft fire detector circuits.

Progress has been made with fundamental studies of the physics of electrical breakdown of dielectrics.

A laboratory has been established during the year specialising in the field of radio-activity with its great potentialities.

Although there has been a welcome increase in the intake of orders since last autumn, there is no doubt that the days of having long order books are over, and that we are back to the pre-war position in many of our products with delivery and price becoming of increasing importance. This applies particularly to our overseas business where, for reasons I have already given, competition is becoming more and more intense.

The relinquishment, however, of Government controls over most of our raw materials, and the growing freedom we therefore enjoy, are a help and challenge to us all in the Group to achieve greater productivity, even higher efficiency and lower costs.

The Chairmanship

In concluding this review of the 1953 results, I also virtually conclude my active service as a director and as your chairman, for it is my intention immediately after the forthcoming General Meeting to resign both these offices.

I get particular pleasure and comfort from the proposed appointment of Mr W. H. McFadzean as my successor in the chair. He and I have worked together closely and happily for over twenty years and since the amalgamation he has been my right-hand man. I commend him to you with complete confidence, and my final wish is that he will receive from all Stockholders and all the B.I.C.C. Team, the understanding and support and trust which I have enjoyed and have so deeply appreciated, and which will always remain one of my most treasured memories.

Also issued with the Accounts was a tribute from the Board of Directors to Sir Alexander Roger on the occasion of his retirement as chairman and director of the company.

JOHNSON & PHILLIPS

Strong Liquid Position

THE forty-ninth annual general meeting of Johnson & Phillips, Ltd., was held yesterday in London.

Mr. G. Leslie Wates, J. P., Comp.I.E.E., chairman and joint managing director, in the course of his speech, said: The trading balance for the year 1953 is just over £600,000, and is less than last year's trading balance by approximately £100,000. This difference in the trading balance is entirely accounted for by our Rubber cable business. During the year the prices of rubber cables were reduced several times as a result of reductions in the prices of certain raw materials and because of a revised British Standard Specification.

The introduction of lower selling prices automatically caused falls in the value of the cables we had in stock, both at home and abroad, the whole of which has been borne in the current trading account.

The other departments, namely, the Paper Cable Department and the Engineering Departments manufacturing Switchgear, Transformers and Capacitors, have done well, and in the aggregate have increased their sales, and their gross and net profit, over those of the previous year. Our Capacitor Department is being completely overhauled and is already beginning to show good results.

Taking our Branches Overseas as a group, they have not done so well as the previous year. In particular, both Australia and South Africa have met with increasing competition and with lower margins of profit. I have every hope that in both these territories we shall do better in 1954 than in 1953. India and Pakistan have both done well and in both these countries, I think for the time being there is ample scope for our activities.

During the year under review our Contract Department has completed a number of large cable installations in Oil Refineries, Chemical Works and in Power Stations belonging to the British Electricity Authority. The latter in particular have provided scope for the use of aluminium sheathed cables, the production of which, as you know, your company pioneered.

I would draw your attention to the satisfactory liquid position of the company. Our current assets amount to £4,399,889 whereas the current liabilities to creditors and others are only £1,331,667 thus showing an excess of £3,068,222.

The Dividend

Although the dividend is at the rate of 15% on the nominal value of the Ordinary shares, by reason of the reserves and the credit balance on Profit and Loss Account, the dividend gross, expressed in terms of percentage on the capital of the shareholders employed in the business is only 6·15% and, after tax, only 3·37% is actually paid to shareholders.

We have for some years been searching for a factory, if possible near Charlton, to provide us with further floor space. We have been fortunate in being able to purchase, at a reasonable price, a commodious factory in New Cross which extends over four acres.

INSULATED SERVICE FUSES

SERIES 3-100

100 AMP

now available

This new range of Insulated Service Fuses, suitable for working currents up to 100 amperes, is similar in design to the popular HENLEY Series 3 Fuses.

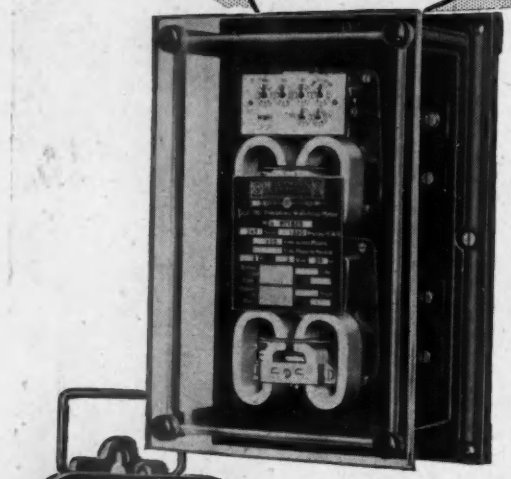
The range consists of single-pole fuses, and double-pole and four-pole fuses with combined Sealing Chambers. Separate Connector Boxes and Sealing Chambers are also available for use with the single-pole fuses.

Please write for Folder 43/B

HENLEY

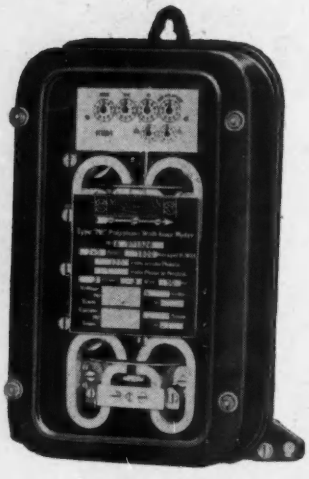
ELECTRICAL DISTRIBUTION EQUIPMENT

W. T. HENLEY'S TELEGRAPH WORKS CO. LTD. 51-53, HATTON GARDEN, LONDON, E.C.1.



Full switchboard Pattern

House-service Pattern



Semi-switchboard Pattern

Metrovick Metering Means Trouble-free Accounts

Metrovick Type NE Polyphase Watt-hour Meters are designed to provide accurate performance from one-twentieth to one-and-a-half times full load. Since large annual charges are based on polyphase meter registrations a high degree of accuracy is important to both authority and consumer.

- Accuracy not significantly affected by normal variations in voltage, frequency, wave form or temperature.
- 4 patterns—house-service, semi-switchboard, full-switchboard and flush.
- Fulfils requirements of BS 37.

Type NE polyphase meters can be fitted with maximum demand indicators, alarm or transmitting contacts. Also available as kVArh meters.

TYPE NE

POLYPHASE WATT-HOUR METERS

for three-phase 3-wire ; two-phase 3- or 4-wire ; and single-phase 3-wire circuits up to 600 volts. Self-contained up to 100 amps.

METROPOLITAN-VICKERS

ELECTRICAL CO LTD · TRAFFORD PARK · MANCHESTER, 17

Member of the AEI group of companies

for Meticulous Metering

G/A404

CLASSIFIED ADVERTISEMENTS

Advertisements should be sent to the Classified Advertisement Dept., Electrical Times, Sardinia House, Sardinia Street, London, W.C.2, before 10 a.m. on TUESDAY of the week of issue. Official Displayed Advertisements are charged at 32s. 6d. per inch, and all other classified advertisements at 2s. 6d. per line. Situations Wanted four insertions at twice the single insertion rate. Fee for Box Number and postage on replies 2s.

TENDERS INVITED

KESWICK URBAN DISTRICT COUNCIL

GROUP "A" STREET LIGHTING

TENDERS are invited for the Supply and Installation in Main St, Keswick, of Thirty-Seven Fluorescent Street Lighting Units each comprising 25 ft Concrete or Steel Column Control Gear and Lantern containing 3—5 ft 80 W Fluorescent Tubes.

Plan and Conditions of Contract may be inspected at the office of, and a copy of the Form of Tender, Specification and Bills of Quantities obtained on application to, the Surveyor, Mr Ralph Lusher, at the Council Offices, 50 Main St, Keswick, Cumberland.

Tenders, on prescribed forms, enclosed in a plain envelope bearing no indication of the sender and endorsed "Tender for Lighting Equipment," to be delivered to the office of the undersigned not later than 9 a.m. on Tuesday, 22 June, 1954.

The Council do not bind themselves to accept the lowest or any tender.

A. E. HENDERSON,
Clerk of the Council.

Council Offices,
50 Main St,
Keswick, Cumberland.
21 May, 1954. (H 845)

NORTH OF SCOTLAND HYDRO-ELECTRIC BOARD

GLEN ESK AND GLEN CLOVA DISTRIBUTION

TENDERS are invited for the construction of 11 kV and Low Voltage Wood Pole Overhead Lines in the Glen Esk and Glen Clova areas. Copies of the Tender Documents may be obtained from the Engineers, Messrs Kennedy and Donkin, 3 North Charlotte St, Edinburgh 2, on receipt of a deposit of £2. 2s. (returnable).

The Board do not bind themselves to accept the lowest or any tender.

W. D. D. FENTON,
Secretary.

16 Rothesay Terr,
Edinburgh 3. (H 848)

COUNTY BOROUGH OF BLACKPOOL

TENDERS are invited for the supply and delivery of:

One, Motor Driven (Petrol) 3 ton Chassis for Tower Body (*b*) below.

(*b*) One, Sectional Tower Body with power elevation fitted on Chassis (*a*) above.

Specifications and Forms of Tender, which will be issued separately for (*a*) and (*b*), may be obtained from the Illuminations and Public Street Lighting Officer, Electrical Services Department, Rigby Rd East, Blackpool, and must be returned to the undersigned at P.O. Box No. 11, Town Hall, Blackpool, in a plain sealed envelope endorsed "Tender for Tower Waggons' and not bearing any name or mark indicating the sender, not later than 10 a.m. on Saturday, 5 June, 1954.

TREVOR T. JONES,
Town Clerk.
(H 825)

BOROUGH OF SWINTON AND PENDLEBURY

ELECTRIC WIRING—48 HOUSES AND 32 FLATS. CLIFTON ESTATE

TENDERS for either or both of the above schemes are invited for the wiring and supply of electrical fittings to dwellings now in course of construction.

Specification and Form of Tender may be obtained from and drawings inspected at the office of the Borough Engineer, Town Hall, Swinton, Lancs.

Tenders sealed in envelopes provided must be returned to reach me not later than 19 June, 1954. The Council do not bind themselves to accept the lowest or any tender.

VINCENT COLLINGE,
Town Clerk.
(H 859)

BOROUGH OF SOUTHALL

IMPROVEMENT OF STREET LIGHTING IN A.3005 (PART)

TENDERS are invited for the provision of the following:

(a) 45 No. 140 W sodium vapour discharge lamps, capacitors and transformers.

(b) 45 No. concrete columns 25 ft high including erection, together with the installation of all electrical equipment.

Contractors tendering should allow for the fact that contracts may be let separately for (a) and (b).

Copies of Form of Tender, Specification and Bill of Quantities may be obtained from, and Conditions of Contract and Drawings inspected at, the Office of the Borough Engineer, Town Hall, Southall, on payment of £2. 2s. which will be refunded on the receipt of a bona fide tender.

Tenders should be delivered to the undersigned, together with all technical information required, in the envelope provided, which should bear no indication of sender, not later than 12 noon on Monday, 21 June, 1954.

The Council do not bind themselves to accept the lowest or any tender.

J. S. SYRETT,
Town Clerk.

Town Clerk's Offices,
South Rd,
Southall, Middlesex.
May, 1954. (H 846)

CITY OF MANCHESTER HOUSING COMMITTEE

TENDERS are invited for Electrical Installations on the following Contracts at Langley Estate:

Contract 205—250 houses
Contract 206—147 houses

Schedules and tender forms may be obtained on application to the Director of Housing, Town Hall, Manchester 2, on payment of a deposit of One Guinea, returnable on receipt of a bona-fide tender. Tenders, which must be sealed, in an official envelope, endorsed "Electrical Installations," and addressed to the Chairman of the Housing Committee, must be received not later than 16 June, 1954.

PHILIP B. DINGLE,
Town Clerk.
(H 847)

SITTINGBOURNE AND MILTON URBAN DISTRICT COUNCIL

STREET LIGHTING INSTALLATION

TENDERS are invited from qualified Contractors for the erection and installation only of:

48 No. 250 W Mercury Vapour Street Lamps at 25 ft Mounting Height, and

24 No. 80 W Mercury Vapour Street Lamps at 15 ft Mounting Height

at various points within the Urban District.

Form of Tender, General Conditions of Contract, Specification and Bill of Quantities can be obtained from the Engineer and Surveyor, Central Ave, Sittingbourne, on receipt of a deposit of £3. 3s. This deposit will be refunded upon receipt of a bona fide tender, not subsequently withdrawn.

Drawings and other particulars may be inspected at the office of the Engineer and Surveyor during normal working hours.

Tenders in sealed envelopes endorsed "Tender for Street Lighting" and bearing no indication of the sender are to be delivered to the undersigned by not later than Monday, 14 June.

The Council do not bind themselves to accept the lowest or any tender.

D. ALLEN,
Clerk of the Council.

Council Offices,
High Street,
Sittingbourne.
18 May, 1954. (H 806)

APPOINTMENTS VACANT

Engagement of persons must be made through a Local Labour Office or Scheduled Employment Agency, if the applicant is a man aged 18–64, or a woman aged 18–59; unless the person concerned is excepted or the employment is in a managerial or professional capacity, or is otherwise excepted from the provisions of the Notification of Vacancies Order, 1952.

CADETSHIPS IN THE ELECTRICAL BRANCH OF THE ROYAL NAVY

THE next annual competition for Cadetships in the Electrical Branch of the Royal Navy will be held in August for entry in September 1954. Completed application forms should be received by the Admiralty on or before 1 July, 1954.

Candidates must be between the ages of 17 and 19½ on 1 Sept., 1954, and must obtain passes in Physics and Mathematics at Advanced Level in the General Certificate of Education (or equivalents.)

Those selected enter Britannia Royal Naval College as Cadets for one term followed by two terms in the Training Carrier. They then receive a further five years' Naval and Electrical Engineering Training as Midshipmen, Sub-Lieutenants and Lieutenants (L), including three years at University. Subsequently, they receive appointments to the Fleet, design departments and dockyards, are responsible for the maintenance and assist in the design of the electrical and electronic equipment of the Navy. Opportunities exist for promotion to Flag Rank.

Further details may be obtained from the Secretary of the Admiralty, N.C.W. Branch (Cadets), Queen Anne's Mansions, St. James's Park, London, S.W.1. (H 701)

BRITISH ELECTRICITY AUTHORITY

South East Scotland Division

ASSISTANT SECTION ENGINEER (Transmission) required for Edinburgh (Currie) Section.

Applicants must have had at least two years' experience in maintenance of 132 kV transmission lines, cables and substation equipment, and possess qualifications leading to Corporate Membership of the Institution of Electrical Engineers.

Salary £584/£745 (N.J.B. Class AX/BX/6) Pension Scheme. No Car Allowance. Transport provided.

Apply in writing by 8 June, 1954, stating age, qualifications and experience to Divisional Controller, British Electricity House, Portobello, Midlothian. (H 808)

SOUTHERN ELECTRICITY BOARD

LOCAL ENGINEER (HIGH WYCOMBE)

READING District of No. 2 (Newbury) Sub-Area. Salary N.J.B. Class G, Grade 7, Column 1 (£729 per annum), N.J.B. Conditions of Service.

The successful applicant will be responsible to the District Engineer for the operation and maintenance of part of the distributing system up to 33 kV and comprising substations and U/G and O/H mains of all classes. He will also be responsible for the construction of minor mains extensions and services. Applicants should have had suitable technical training and experience of similar work. The appointment will involve standby duties.

DEMONSTRATOR (HIGH WYCOMBE)

Reading District of No. 2 (Newbury) Sub-Area. Salary N.J.C. Grade 1 (£400/£490 per annum). N.J.C. Conditions of Service.

Applicants should be women who are qualified to advise generally on the utilisation of electric domestic appliances, to give public demonstrations of apparatus and to assist in showroom duties. The possession of an E.A.W. Certificate, or equivalent Domestic Science qualification, will be an advantage.

The successful candidates for the above appointments will be required to contribute to the B.E.A. and Area Boards' Superannuation Scheme, if eligible.

Applications on forms obtainable from the Sub-Area Secretary, 7 Oxford Rd, Newbury, and returned to him in envelopes suitably endorsed, not later than 11 June, 1954.

METER TESTERS

Sub-Area Engineering Department (Meter Section) of No. 1 (Southall) Sub-Area, Waterloo Rd, Uxbridge. Wages as set out in Schedule A of the N.J.I.C. Agreement (i.e. 48d. per hour). N.J.I.C. Conditions of Service.

Duties will be to test D.C. and single-phase A.C. meters, kVA, poly-phase and summation meters and indicating and recording instruments.

METER REPAIRERS (MECHANICIAN)

Sub-Area Engineering Department (Meter Section) of No. 1 (Southall) Sub-Area, Waterloo Rd, Uxbridge. Wages as set out in Schedule A of the N.J.I.C. Agreement (i.e. 48d. per hour). N.J.I.C. Conditions of Service.

Applicants should have had experience in the repair of all types of meters, including poly-phase, kVA and summator.

Applications for the above vacancies, in writing, to the Sub-Area Secretary, 2-6 Windmill Lane, Southall, Middlesex, not later than 11 June, 1954. (H 841)

KARACHI ELECTRIC SUPPLY CORPORATION

APPLICATIONS are invited for the following posts with The Karachi Electric Supply Corporation Ltd., Karachi, Pakistan, which owns two adjoining oil/gas-fired Steam Power Stations, one 25 (5 x 5) MW and one 30 (2 x 15) MW (under construction—400 psig/775° F, 11·4/66 kV block transformation), also Diesel Power Station (6 MW). Each appointment will be initially for 3 years. Monthly salaries will be paid in Pakistani Rupees per month in the scales stated below. A higher salary than the maximum may be granted in deserving cases (at present £1=Rs. 9/5/-). Employees engaged from overseas will also receive Overseas Allowance stated below. First-class passage forward at commencement and return on termination of agreement and also during leave after 3 years' service will be paid, also for wife and up to three children. Motor Car Allowance will be given to those owning cars. Applications stating age, qualifications, full particulars of experience, posts held and salary drawn during last seven years, and names of three independent referees, should be addressed to the Managing Director (Agents), Karachi Electric Supply Corporation Ltd., Electric House, Elphinstone St, Karachi, Pakistan. Each application will be acknowledged.

(*a*) DEPUTY MANAGER (Generation).—Salary Rs.2,250—100—3,050 per mensem.

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Overseas Allowance Rs.400 per mensem. Motor Car Allowance Rs.200 per mensem. To take administrative charge of all K.E.S.C. power-generation facilities. Applicant must have had good general and high technical education, preferably be a Corporate Member of a recognised Engineering Institution and have had at least 15/20 years' specialised experience in planning, installation, operation and maintenance of large Steam Power Stations, preferably with oil/gas-fired boilers. The applicant must also have had specialised administrative experience in this field.

(*b*) DEPUTY MANAGER (Transmission and Distribution).—Salary Rs.2,250—100—2,750 per mensem. Overseas Allowance Rs.400 per mensem. Motor Car Allowance Rs.200 per mensem. Applicant must have had good general and high technical education, preferably be a Corporate Member of a recognised Electrical Engineering Institution, and have had at least 15/20 years' experience in planning, estimating, installation, operation and maintenance of 66-kV, 11-kV, 6·6-kV and low voltage cables, overhead lines and substations. The applicant must have also had administrative experience in this field.

(*c*) PROJECT ENGINEER (Transmission and Distribution).—Salary Rs.1,750—100—2,050 per mensem. Overseas Allowance Rs.300 per mensem. Motor Car Allowance Rs.175 per mensem. Applicant must have good general and technical education and be a Corporate member of a recognised Electrical Engineering Institution and have had at least 10 years' experience in the planning, estimating and erection of 66-kV, 11-kV, 6·6-kv and low voltage cables, overhead lines and substations.

(*d*) DEPUTY MANAGER (Commercial).—Salary Rs.2,250—100—2,750 per mensem. Overseas Allowance Rs.400 per mensem. To take full charge of Commercial Department. Applicant must have had education in Electrical Engineering to degree or diploma standard and must possess approved qualifications and experience of at least 15/20 years in the work connected with tariffs and power supply to industrial consumers.

(*e*) ASSISTANT MANAGER (Accounts).—Salary Rs. 1,750—100—2,050 per mensem. Overseas Allowance Rs.300 per mensem. Applicant must possess approved qualifications in commercial accountancy and must have had at least 10/15 years' experience in responsible posts in this field—preferably with power supply undertakings.

(*f*) ASSISTANT MANAGER (Commercial).—Salary Rs.1,750—100—2,050 per mensem. Overseas Allowance Rs. 300 per mensem. Applicant must have had at least 10/15 years' experience in responsible posts connected with tariffs and power supply to industrial consumers. (H 753)

THE SOUTH EAST SCOTLAND ELECTRICITY BOARD

Edinburgh Sub-Area

APPLICATIONS are invited from fully-qualified engineers for the following superannuable appointments:

1. DISTRICT ENGINEER, Grade F.3 (£912/£951 per annum).

2. FIRST ASSISTANT DISTRICT ENGINEER, N.J.B. Grade F.5 (£791/£818 per annum).

Candidates should have had a wide experience in all branches of distribution work including construction, operation and maintenance of underground systems up to 33 kV.

Applications stating age, qualifications, training, experience and present position should be received by the undersigned within 14 days.

G. T. ALLCOCK,
Sub-Area Manager.

Dewar Place,
Edinburgh, 3. (H 810)

CITY OF BIRMINGHAM PUBLIC WORKS DEPARTMENT

APPLICATIONS are invited for the following posts in the Mechanical Section:

(a) HEATING AND VENTILATING ENGINEERING ASSISTANT

Grade A.P.T. VI (£695/£760 per annum).

(b) ELECTRICAL ENGINEERING ASSISTANT

Grade A.P.T. IV (£580/£625 per annum).

Commencing salary will be in accordance with qualifications and experience.

Applicants for post (a) should be Associate Members of the Institution of Mechanical Engineers or Institution of Heating and Ventilating Engineers, and should have had experience in the design, specification and supervision of contracts for heating, ventilating and allied services in large public buildings.

Applicants for post (b) should have passed Part 1 of the Institution of Electrical Engineers Associate Membership Examination or hold an equivalent qualification. They should have had experience in the design and specification of electric lighting, power and heating installations for large public buildings, etc.

The posts are permanent, superannuable, subject to a medical examination, and to one month's notice on either side.

Applications endorsed with the heading of the post applied for, stating qualifications, age and experience, together with the names of two persons to whom reference can be made should reach the undersigned not later than 12 June, 1954.

Canvassing disqualifies.

HERBERT J. MANZONI,
City Engineer and Surveyor.

Civic Centre,
Birmingham, 1.
17 May, 1954. (H 799)

NORTH EASTERN ELECTRICITY BOARD

Wear Sub-Area

APPLICATIONS are invited for the following appointments:

SECOND ASSISTANT DISTRICT ENGINEER, Consett District (Harelaw). Salary, Schedule "A," Class "D," Grade 7, £633/£643, N.J.B. conditions of service.

ONE ENGINEERING DRAUGHTSMAN at Sub-Area Headquarters. Ability to drive car an advantage. Salary, Schedule "D," Grade 6, £433/£567, N.J.B. conditions of service.

Applications stating age, qualifications and experience, should be forwarded to the Secretary (Establishments), The North Eastern Electricity Board, G.P.O. Box No. 117, Carliol House, Newcastle upon Tyne 1, within ten days of the appearance of this advertisement. (H 843)

BRITISH ELECTRICITY AUTHORITY

Eastern Division

APPLICATIONS are invited for the following posts:

STATION SHIFT CONTROL ENGINEER
WATFORD GENERATING STATION

Salary Class E, Grade 10, £555/£569 per annum plus London Weighting.

Applicants should have reached the standard of Ordinary National Certificate in Electrical Engineering or its equivalent, have had experience in the operation of a Switchboard at a Generating Station and be fully conversant with High Voltage Switching operations and protective systems.

ASSISTANT ENGINEER (EFFICIENCY AND TESTING) RYE HOUSE GENERATING STATION

Salary Class G, Grade 7, £729/£758 per annum.

Applicants should possess the Higher National Certificate in Mechanical and/or Electrical Engineering or other equivalent qualifications and have had previous experience in the efficient operation and testing of modern boilers and turbo alternators.

Applications stating age, qualifications and experience should be sent to the Controller, British Electricity Authority, Eastern Division, Northmet House, Southgate, N.14, by 5 June, 1954.

W. N. C. CLINCH,
Controller.
(H 819)

BRITISH ELECTRICITY AUTHORITY
East Midlands Division

APPLICATIONS are invited for the following positions within the Division:

Vacancy No. 77/54/ET
JUNIOR ENGINEER
AVON POWER STATION

Applicants should be suitably qualified Engineers with some experience in Power Station operation.

Salary for this appointment is £445 per annum within Class E, Grade 14, of the National Joint Board Agreement.

Closing date for receipt of applications will be 9 June, 1954.

Vacancy No. 81/54/ET
JUNIOR ENGINEER
NORTH WILFORD POWER STATION

A suitable candidate will be given the opportunity to obtain operating and maintenance experience in the various sections of this large Generating Station operating at 850° F/600 lb sq ins. steam conditions. The initial salary will be £545 per annum within Class K, Grade 15, of the National Joint Board Agreement.

Preference will be given to the candidates who hold the Higher National Certificate or who are at present pursuing a course of study with the object of obtaining this or a similar qualification.

Closing date for receipt of applications will be 15 June, 1954.

Vacancy No. 80/54/ET
SECOND ASSISTANT STATION CHEMIST
FREEMAN'S GENERATING STATION
LEICESTER

Experience of analyses of fuel, water and oils is desirable and educational standard up to Higher National Certificate would be an advantage.

Salary in accordance with Class H, Grade 11 (£607/£628 per annum), of the National Joint Board Agreement.

Closing date for receipt of applications will be 15 June, 1954.

The above positions will be pensionable within the provisions of the British Electricity Authority and Area Boards Superannuation Scheme.

Applications should be submitted on the official form which may be obtained from the Divisional Establishments Officer, British Electricity Authority, P.O. Box No. 25, British Electricity House, Barker Gate, Nottingham, and should be returned to the undersigned by the date stated. Please quote Vacancy Number.

L. F. JEFFREY,
Divisional Controller.
(H 844)

BRITISH ELECTRICITY AUTHORITY
North West, Merseyside and N. Wales Division

INVITE applications for the post of DIVISIONAL ELECTRICAL ENGINEER based at Divisional Headquarters, Manchester. The officer appointed will be responsible for the administrative control of the department dealing with:

(a) Maintenance and new construction associated with the Divisional high voltage grid transmission system;
(b) Protection, metering, communications and other light current engineering associated with the generation and main transmission of electricity in the Division;
(c) Preparation of schemes for system development and reinforcement, and any special problems of electrical investigation associated with Divisional working.

Candidates should have had previous experience in both heavy and light current engineering associated with a large power system. Membership of the Institution of Electrical Engineers or other similar professional Institutions would be an advantage.

The salary for the post will be within the scale £1,900—£2,050 p.a.

Applications stating age, present position and salary, full details of qualifications and experience, to D. Moffat, Director of Establishments, British Electricity Authority, Winsley St, London, W.1, by 12 June, 1954. Please quote reference AE.484. (H 815)

MIDLANDS ELECTRICITY BOARD

APPLICATIONS are invited for the following superannuable posts:
GENERAL ASSISTANT DISTRICT ENGINEERS (TWO)
CANNOCK DISTRICT
WOLVERHAMPTON & DISTRICT SUB-AREA

Experience necessary in all branches of Distribution Work including routine testing and maintenance of Substation plant, Transformers, Switchgear and Protective equipment. Technical qualifications desirable. Salary £447/£460 per annum (N.J.B. Class "E," Grade 13). Apply, in writing, within 14 days stating age, qualifications, present position and salary to Mr F. J. Elliott, Sub-Area Manager, Midlands Electricity Board, 83 Darlington St, Wolverhampton.

GENERAL ASSISTANT DISTRICT ENGINEER
HEREFORD DISTRICT
SHROPSHIRE & HEREFORDSHIRE SUB-AREA

Experience necessary in all branches of Distribution Work including the operation and maintenance of high and low voltage underground and overhead distribution systems. Technical qualifications desirable. Salary £447/£460 per annum (N.J.B. Class "E," Grade 13). Apply, in writing, within seven days stating age, experience, present salary and position to Mr W. Winwood, Sub-Area Manager, Midlands Electricity Board, Spring Gardens, Ditherington, Shrewsbury. A. Stephens, Secretary. (H 837)

BRITISH ELECTRICITY AUTHORITY
Midlands Division

APPLICATIONS are invited for the following positions in the Generation (Operation) Department. N.J.B. service conditions, superannuable appointments, salaries within Schedule "A" of the Agreement:

(a) SHIFT CHARGE ENGINEER at Wolverhampton Power Station, Grade E7, commencing at £649 per annum, plus £50 for load control duties.
(Vacancy No. 669 MD)

(b) ASSISTANT ENGINEER (Technical Records) at Hams Hall "A" Power Station, Grade J12, commencing at £596 per annum.
(Vacancy No. 670 MD)

Applicants for these positions should have received a sound technical training and power station practical experience, in particular for (a) in the operation, maintenance and control of steam generating plant and main switchgear, and for (b) a knowledge of statistics and the keeping of technical records is desirable. Appropriate qualifications an advantage.

Apply quoting the vacancy number, on form AE6, available from the Establishments Officer, 53 Wake Green Rd, Moseley, Birmingham 13, by 12 June, 1954. (H 835)

THE SOUTH WEST SCOTLAND ELECTRICITY BOARD
Glasgow Sub-Area

VACANCY—DEMONSTRATOR

APPLICATIONS are invited for the position of:

DEMONSTRATOR in the Glasgow Sub-Area.

Applicants should possess recognised diplomas or certificates in domestic science, and also the E.A.W. Certificate.

They must be capable of giving lectures and demonstrations, and of advising consumers in the use of electrical apparatus, and be available to give general assistance in Service Centres.

The conditions of employment will be those of the Agreement of the National Joint Council (Administrative and Clerical Grades) and the salary will be in accordance with that Agreement, viz. Grade 1, £400/£490 per annum.

Applications should be made on the official form which may be obtained from the undersigned and which should be completed and returned not later than 12 June, 1954.

J. CAIRNS,
Secretary.

75 Waterloo St,
Glasgow, C.2.
19 May, 1954. (H 818)

MERSEYSIDE AND NORTH WALES ELECTRICITY BOARD

SYSTEM CONTROL ENGINEER (Shift) required in the No. 4/5 Sub-Area Operation Department based on the Control Centre at Legacy, near Wrexham. Salary £680/£706 p.a. (N.J.B. Class J, Grade 10). Appointment superannuable and subject to medical examination.

Duties, which will be on a continuous shift basis, will be those normally associated with switching operations and load transfers on an extensive E.H.V. system interconnecting 132/33 kV injection points and a number of hydro-electric stations.

Applicants should have had operational experience in distribution work and in substations. Possession of the technical qualifications necessary to enable them to become Chartered Electrical Engineers advantageous.

Standard application forms obtainable from the Manager, No. 4/5 Sub-Area, Electricity House, Rhostyllen, near Wrexham. Closing date: 8 June, 1954. (H 809)

BRITISH ELECTRICITY AUTHORITY
North Eastern Division

APPOINTMENT OF ASSISTANT SHIFT CHARGE ENGINEER
SCARBOROUGH POWER STATION

APPLICATIONS are invited for the appointment of Assistant Shift Charge Engineer at Scarborough Power Station.

Applicants should have served a recognised engineering apprenticeship, and should possess technical qualifications. Some experience in electricity generation would be an advantage.

The salary for the appointment (which is superannuable) will be in accordance with the National Joint Board Agreement, Schedule "A," Grade 9, Class C (£532/£551 per annum).

Forms of application may be obtained from Divisional Establishments Officer, British Electricity Authority, North Eastern Division, Carliol House, Newcastle upon Tyne, to whom they should be returned to arrive not later than 5 June, 1954. (H 800)

BRITISH ELECTRICITY AUTHORITY
London Division

APPLICATIONS are invited for the following superannuable posts. Salary includes London Allowance. Conditions of service in accordance with N.J.B. Agreement, Schedule A or C. Qualifications entitling to Graduate Membership of the I.E.E. or I.Mech.E. an advantage, for posts (*a*)

SECOND ASSISTANT STATION CHEMIST—
FULHAM GENERATING STATION

Vacancy No. 54/389

Candidates should be qualified to H.N.C. standard in Chemistry. Duties will entail assistance with and some supervision of routine water, fuel and oil analysis, together with work requiring more advanced analytical technique. Candidates should have considerable industrial experience preferably in the laboratory of a modern power station with H.P. plant. A knowledge of automatic water softening plant processes will be an advantage. Salary—Class L, Grade 11= £752. 17s. p.a.

(a) ASSISTANT SHIFT CHARGE ENGINEER—
ST. MARYLEBONE GENERATING STATION

Vacancy No. 54/390

Sound technical training with practical experience in Generating Station operation. Salary—Class E, Grade 9=£616. 7s. p.a.

(b) JUNIOR ENGINEER (EFFICIENCY AND TESTING) DIVISIONAL HEADQUARTERS

Vacancy No. 54/391

Candidates should have a good technical education. Duties will include the preparation of operating statistical returns. Knowledge of Station statistics is desirable. Salary in range Schedule C, Class AX, Grade 9= £415/£550. 5s. p.a.

Applications, quoting vacancy number, may be made on form obtainable from Divisional Secretary, British Electricity Authority, London Division, Generation House, Great Portland St, W.1, and be received within 14 days of this advertisement. (H 824)

YORKSHIRE ELECTRICITY BOARD

Head Office

PRINCIPAL ASSISTANT

APPLICATIONS are invited for the post of Principal Assistant in the Development Section of Commercial Department at Head Office.

Applicants should have had a good general education and have a comprehensive knowledge of administrative and commercial work in the Supply Industry with experience in appliance and apparatus trading, i.e. purchase and sales (both credit and H.P.), service centres, E.D.A. activities, collection and collation of information, returns, reports and general correspondence.

Salary—N.J.C. Grade 7, £805/£30/£895 per annum.

Applications, giving full details of age, qualifications and experience, together with the names of two referees should be forwarded to the Secretary, Yorkshire Electricity Board, Wetherby Rd, Scarcroft, Leeds, not later than 10 June, 1954.

No. 4 (Leeds) Sub-Area

Wetherby District
(1 post Wetherby)
(1 post Garforth)

GENERAL ASSISTANT DISTRICT ENGINEERS

Applicants should possess good general and technical education and training, and have had experience in the construction, operation and maintenance of E.H.T. and L.T. overhead and underground distribution systems, in a mixed Urban and Rural District.

The successful applicants will be required to reside in the locality.

Salary—N.J.B. Schedule Class E, Grade 11, £524/£540 per annum.

Applications, giving full details of age, qualifications and experience, together with the names of two referees should be forwarded to the Manager, No. 4 (Leeds) Sub-Area, Yorkshire Electricity Board, Bramhope, Leeds, not later than 10 June, 1954. (H 820)

MINISTRY OF FUEL AND POWER

MINES INSPECTORATE

THE Civil Service Commissioners invite applications from men for a pensionable post in London of H.M. Deputy Principal Electrical Inspector of Mines and Quarries. Age at least 35 on 1 Dec., 1953.

Candidates must be Corporate Members of the Institution of Electrical Engineers: the possession of a degree in Electrical Engineering in addition would be an advantage. All candidates must have had, within the last five years, at least two years' practical experience in the application of electricity to mining.

Inclusive salary £1,459/£1,775. Promotion prospects.

Further particulars and application forms from the Civil Service Commission, Scientific Branch, 7th Floor, Trinidad House, Old Burlington St, London, W.1, quoting No. S4287/54. Completed applications must be returned by 30 June, 1954. (H 833)

BRITISH ELECTRICITY AUTHORITY

Midlands Division

THIRD ASSISTANT ENGINEER (Civil) is required in the Transmission Department at Divisional Headquarters. National Joint Board service conditions, superannuable appointment, salary within Schedule C, Grade 5 of the Agreement, £649/£858 per annum.

Applicants should have received a thorough training in civil engineering and preferably have passed parts "A" and "B" of the examination for Associate Membership of the Institution of Civil Engineers, or hold qualifications exempting therefrom. They should have had experience in the design, setting out and supervision of siteworks, foundations, buildings and reinforced concrete structures, and should be accustomed to dealing with specifications, bills of quantities, drawings and correspondence relating thereto.

Apply, quoting Vacancy No. 671MD, on form AE6, available from the Establishments Officer, 53 Wake Green Rd, Moseley, Birmingham 13, by 19 June, 1954. (H 834)

UGANDA ELECTRICITY BOARD

APPLICATIONS are invited for the appointment of DRAUGHTSMEN.

Applicants should have had sound technical training. Drawing Office experience with an Electricity Supply Authority is desirable and a knowledge of E.H.V. system design, substation and switchgear layout and general field work will be an advantage.

Commencing salary within scale £783/£1,053 (including 35% cost-of-living allowance) to be determined according to age and experience.

Free partly-furnished accommodation or allowance in lieu; free medical and dental treatment; three-year contract in the first instance, with free passages for the successful candidate and family, up to a maximum of 3 adult fares. Six months' leave on full pay at end of contract.

Application forms and further information obtainable from the Board's London Office, 27 Regent St, S.W.1. Applications should reach the Board's London Office not later than 14 June, 1954.

C. R. WESTLAKE,
Chairman.

P.O. Box 559,
Kampala, Uganda,
East Africa. (H 801)

BRITISH ELECTRICITY AUTHORITY

South Western Division

TECHNICAL STAFF VACANCIES

REQUIRED for System Operation Department, Divisional Headquarters, Bristol:

GENERAL ASSISTANTS for shift/day duties in Control Room and office. Switching, costing, and general statistical work.

Salary N.J.B. Class AX/EX, Grade 7, £530—£666/£734—£748.

GENERAL ASSISTANTS for day duties of statistical and records nature.

Salary N.J.B. Class AX/EX, Grade 8, £501—£639/£700—£714.

Superannuation Scheme.

Good general and technical education essential. Applicants should have passed the I.E.E. Examination or equivalent. Steam Generating Station experience an advantage.

Applications on Form AE6/ACT, obtainable from the Divisional Secretary, 26 Oakfield Rd, Bristol 8, should be completed and returned by 19 June, 1954. (H 822)

CITY OF SALISBURY SOUTHERN RHODESIA

VACANCY FOR TECHNICAL ASSISTANT, GRADE 2

APPLICATIONS are invited for the post of Technical Assistant, Grade 2 (Test Room Assistant), on the salary grade £900 x £50—£1,150 in the Test Section of the Electricity Department.

Candidates should have a sound knowledge of, and be able to carry out, tests on all types of protection on H.T. and L.T. switchgear on site and in the Test Room, and they should have had experience on General Test Room work, and on instruments and relays.

The appointment will be subject to Council's Service and Leave Regulations, and any amendments thereto. The salary payable will commence at the minimum of the scale, and rise by annual increments to the maximum; no cost of living or other allowances are payable.

The successful applicant must be able to comply with the requirements of the Rhodesian Immigration Authorities, and will be required to submit a satisfactory medical certificate of fitness.

Applicants are requested to submit full particulars of their qualifications, training and experience, giving full details of positions held, marital state, age, place of birth, and nationality. Copies of not more than three recent testimonials may be included.

Canvassing directly or indirectly will be a disqualification.

Applications, suitably endorsed on the cover, must reach the offices of the undersigned on or before Saturday, 19 June, 1954.

Airmail paper should be used.

Davis and Soper Ltd.,
52 and 54 St. Mary Axe,
London, E.C.3.

18 May, 1954. (H 823)

EASTERN ELECTRICITY BOARD

APPLICATIONS are invited for the following vacancies:

Northmet Sub-Area

St. Albans and Welwyn Garden City District

63/54.R.

GENERAL ASSISTANT ENGINEER

Candidates should have had a sound technical training and experience in the construction, operation and maintenance of H.V. and L.V. overhead and underground systems.

Salary in accordance with Class F, Grade 11, of the National Joint Board Salary Agreement commencing at £548.

Apply to the District Manager, Eastern Electricity Board, 107 St. Peter's St, St. Albans, Herts.

Barnet District

64/54.R.

SENIOR SALES REPRESENTATIVE

The duties will consist of giving advice on supply matters, tariffs, apparatus and sales to consumers with domestic or small commercial or industrial installations.

Salary in accordance with Grade 2 (£485 by £20—£545) of the National Joint Council Salary Agreement, plus London Weighting.

Apply to the District Manager, Eastern Electricity Board, 7c High St, Barnet, Herts.

Fens Sub-Area

65/54.R

(a) GENERAL ASSISTANT ENGINEER
CONSTRUCTION

This appointment is in the Construction section of the Sub-Area Engineering Department, the operational base of which is at St. Neots. The Sub-Area is operated as a single administrative unit and the duties involve field work over the whole of the Sub-Area.

Candidates should have had a sound technical training and experience in the construction of H.V. and L.V. overhead and underground systems in both urban and rural areas.

66/54.R

(b) 3RD ASSISTANT ENGINEER
(OPERATION & MAINTENANCE)

67/54.R

(c) GENERAL ASSISTANT ENGINEER
(OPERATION & MAINTENANCE)

These appointments are in the Northern System of the Operation and Maintenance Section of the Sub-Area Engineering department, comprising Peterborough, March and Wisbech.

Candidates should have had experience in the operation and maintenance of overhead and underground systems, the compilation of records dealing with faults, system leadings and operations, etc. Possession of the Higher National Certificate in Electrical Engineering, or its equivalent will be an advantage.

Salary for these three appointments will be in accordance with Class H of the National Joint Board Salary Agreement as follows:

(*a*) Grade 13, commencing at £523.
(*b*) Grade 11, commencing at £607.
(*c*) Grade 13, commencing at £523.

Apply to the Manager, Fens Sub-Area, Eastern Electricity Board, Milton Hall, Milton, Cambridge.

Future salary and conditions of service for all these appointments will be in accordance with agreements made from time to time by the appropriate negotiating bodies.

The successful candidates will be required to contribute to a superannuation scheme and may be required to undergo a medical examination.

Applications by letter, stating age, education, qualifications and experience with details of present appointment and salary, should be submitted to the Manager concerned within fourteen days of the appearance of this advertisement. (H 836)

Box No. replies to be addressed to the ELECTRICAL TIMES, Sardinia House, Sardinia Street, London, W.C.2.

SOUTH WESTERN ELECTRICITY BOARD

TECHNICAL ASSISTANT—BRISTOL

APPLICATIONS are invited for the above appointment at Area Board Headquarters, Bristol.

Candidates should possess an Engineering Degree or be Corporate Members of the Institution of Electrical Engineers, with at least five years' experience in Supply Industry.

Duties will include technical investigations; drafting of technical specifications for all types of distribution plant up to 33 kV; analysis of high voltage fault reports; inspection of damaged plant on site and new plant at manufacturers' works.

Salary within Class AX, Grade 5, £649/£790 N.J.B. Agreement.

Application forms from Assistant Secretary (Establishments), Electricity House, Bristol, to be returned completed by 10 June. (H 840)

BRITISH ELECTRICITY AUTHORITY
Southern Division

APPLICATIONS are invited for the following vacancy:

S/13.534
SHIFT CHARGE ENGINEER
POOLE GENERATING STATION

Applicants should be in possession of technical qualifications admitting to corporate membership of a recognised professional institution, have had previous experience in a large modern generating station, and preferably have had experience of a modern station with high temperatures and pressures and pulverised fuel equipment.

Salary N.J.B. H/7, £772/£802.

Special application forms, obtainable from P. D. A. Oliver, Esq., Divisional Secretary, 111 High St, Portsmouth, should be returned by 9 June, 1954. (H 839)

MERSEYSIDE AND NORTH WALES ELECTRICITY BOARD

FIRST ASSISTANT DISTRICT ENGINEER required in the Chester District of the Board's No. 3 Sub-Area. Salary £850/£887 p.a. (N.J.B. F/4). Appointment superannuable and subject to medical examination.

Applicants should have the technical qualifications necessary to enable them to become Chartered Electrical Engineers, and experience on construction, operation and maintenance of H.T. and L.T. underground and overhead networks in urban and rural areas.

Application forms, obtainable on written request from the Manager, No. 3 Sub-Area, Electricity House, Newgate St, Chester, should be returned not later than 8 June, 1954. (H 821)

BRITISH ELECTRICITY AUTHORITY
South Wales Division

Vacancy No. 51/54

APPLICATIONS invited for superannuable N.J.C. appointment of ASSISTANT in the Statistics Section of Generation (Operation) Department at this Headquarters. Salary Grade 3, £545/£605 per annum.

Responsible for monthly returns and reports, supervision of routine calculations. University Degree (preferably in Economics (Statistics) or Maths) or equivalent and/or experience in the Electrical Supply Industry.

Application forms obtainable from Secretary, South Wales Division, British Electricity Authority, Twyn-y-fedwen Rd, Gabalfa, Cardiff, to be returned by 14 June, 1954. (H 838)

DRAWING OFFICE STAFF

BRITISH ELECTRICITY AUTHORITY HEADQUARTERS, Bankside House, London, require:

(a) DRAUGHTSMAN (£458/£595) and a SENIOR DRAUGHTSMAN (£595/£705) for Building and Civil Engineering Works.

(b) CARTOGRAPHIC DRAUGHTSMAN (£430/£520) for work on maps, diagrams and charts.

All salaries quoted include London Allowance. Pension Scheme. One Saturday morning in four on duty. Forms from D. Moffat, Director of Establishments. Quote Ref: E.T.482. (H 814)

SOUTH EASTERN ELECTRICITY BOARD

GENERAL ASSISTANT ENGINEER
Woking District

SALARY £649 under N.J.B. E.7, or £619 under N.J.B. E.8, according to qualifications and experience. Superannuable. Applicants should have had a good general education and technical training up to Higher National Certificate standard or equivalent. Experience in distribution work is essential.

Applications, naming 2 referees, on forms from J. C. Poole, A.M.I.E.E., Woking Manager, SEEBoard, 4 Chobham Rd, Woking, to be returned by 9 June, 1954.

ASSISTANT DISTRICT ENGINEER
Sevenoaks District

Salary £524 p.a. under N.J.B. Class "E," Grade 11. Superannuable. Applicants should be suitably qualified and have had training and experience in the construction, operation and maintenance of underground and overhead distribution systems, preferably up to 33 kV. The position will entail standby duties.

Applications, naming 2 referees to H. F. Gill, Sevenoaks and Horley District Manager, SEEBoard, Electric House, West Hill, Oxted, Surrey, by 9 June, 1954.

CARTOGRAPHIC DRAUGHTSMAN
Croydon and W. Kent Sub-Area H.Q.

Salary £400 x £20—£480 x £10—£490 p.a. plus £30 London Weighting under N.J.C. Grade 1. Superannuable. Applicants should have sound general education and experience in the preparation of layouts and diagrams for the installation of E.H.T. and L.T. switchgear, transformers and associated cabling.

Applications on forms from T. A. D. Honnor, M.E.E.E., Sub-Area Manager, SEEBoard, Electric House, Wellesley Rd, Croydon, to be returned by 9 June, 1954.

SHOWROOM ASSISTANT
(Male)
West Kent District

Salary £170 at age 16 to £395 at 26 rising subject to satisfactory service to £470 p.a. plus London Weighting. Superannuable. Experience of showroom sales, tariffs and apparatus desirable.

Applications on forms from P. S. Watson, M.I.E.E., West Kent District Manager, SEEBoard, 270 High St, Orpington, Kent, to be returned by 9 June, 1954.

LINESMAN
(Overhead Power)
Crawley District

Wages 3s. 6d. per hour for 44 hour, 5 day week under N.J.I.C. Agreement. Applicants should have experience in the construction and maintenance of 11 kV and L.V. overhead lines. Under certain conditions it may be possible to arrange housing accommodation.

Applications, naming 2 referees, on forms from F. A. Avery, A.I.E.E., Crawley District Manager, SEEBoard, 55 High St, Crawley, to be returned by 9 June, 1954.

A. L. BURNELL,
Secretary.
(H 842)

BRITISH ELECTRICITY AUTHORITY
South Eastern Division

JUNIOR ENGINEER (Efficiency), Kingston "B" Power Station. Applications are invited from young men seeking a career in the Electricity Supply Industry. For this superannuable position, which will give useful background experience, preference will be given to candidates possessing Ordinary National Certificate. Good technical college facilities. N.J.B. Conditions of Service, Class G, Grade 16/14, commencing at £402 per annum and rising to £491 per annum, plus London Allowance. Applications, giving details of education, present position, experience, etc., should be received by the Station Superintendent, Kingston "B" Power Station, Down Hall Rd, Kingston-on-Thames, not later than 7 June, 1954. (H 860)

ALKALINE BATTERIES LTD., of Redditch, are the largest makers in the Empire of Alkaline accumulators, miners' lamps and emergency lighting systems, which are in rapidly growing use particularly for

continued in next column

continued from previous column

export. The company has vacancies in its Technical Sales and Development Sections for Graduate ELECTRICAL ENGINEERS, not over 30 years of age, or for men nearing the end of their Degree Course who have completed National Service. The posts are pensionable and offer the prospect of executive rank. Applications with full educational details and experience should be addressed to Commercial Manager, Alkaline Batteries Ltd., Union St, Redditch. (H 721)

CONTRACTS ENGINEERS required for handling of Switchgear tenders and contracts. Applications should state age, experience, qualifications and salary required and should be addressed to Personnel Manager, South Wales Switchgear Ltd., Blackwood, Mon. (H 854)

EWBANK AND PARTNERS LIMITED require for the Middle East a DEPUTY POWER STATION SUPERINTENDENT for a 30 MW capacity Power Station together with a Distillation Plant having a capacity of two million gallons per day. Applicants should have held a Deputy Station Superintendent's position for at least three years. Preference will be given to applicants under 40 years of age. Experience with oil and gas fired boilers, condensing and back pressure turbo-alternators and large triple effect evaporators will be an advantage. Applicants should also have a working knowledge of Power Station chemistry. Full details of qualifications, training and experience must accompany the application. The starting salary offered is from £1,300 to £1,500 per annum according to experience plus a living allowance. Free furnished bachelor quarters and medical attention are provided. The contract in the first place is for two years and may be extended. Married accommodation is difficult and applicants must be prepared to occupy bachelor accommodation for at least the first year of service. Applications to be addressed to the Secretary, Ewbank and Partners Limited, Engineering Consultants, 10/11 Grosvenor Place, London, S.W.1. (H 762)

ELECTRICAL DRAUGHTSMEN for design of lighting, power and instrument installations for chemical and oil refinery plants. Applicants should be experienced in the preparation of bills of material from design drawings. Salaries above average, five-day week, generous staff pension scheme. Write stating age, experience, and qualifications to Head Wrightson Processes Ltd., 24 Baltic St, London, E.C.1. (H 625)

ELECTRICAL DRAUGHTSMAN required for Persian Gulf by large Oil Company. Applicants should be under 35, with National Certificate and experienced in power and lighting installation drawing for industrial and domestic buildings, layout of L.T. and E.H.T. networks, and preferably preparation of Bills of Materials. Pensionable emoluments from £900 (incremental) plus substantial local living allowance, paid home leave (with passages) and at present no income tax. Bachelors preferred as no married accommodation available for first contract. Write, giving details and quoting No. 452 to Box No. 7669, c/o Charles Barker and Sons Ltd., 31 Budge Row, London, E.C.4. (H 816)

EWBANK and Partners have vacancies for the following: MECHANICAL ENGINEERING DRAUGHTSMEN experienced in power station design and layout, pipework layout, circulating water systems, and with some knowledge of coal and ash handling plants.

ELECTRICAL ENGINEERING DRAUGHTSMEN experienced in power station and substation distribution systems.

The positions are permanent and are pensionable. Free lunches are provided and a five-day week is in operation. Applicants should write in the first instance, stating age, details of experience and salary required to the Personnel Officer, Ewbank and Partners, Engineering Consultants, 10/11 Grosvenor Place, London, S.W.1. (H 802)

EDITOR required for monthly Technical publication, wide circulation. Must be expert in attractive typography and layout, able to write special articles and to rewrite, condense or expand other material. Professional qualification in Science or Engineering with subsequent journalistic experience essential. Three year contract would be considered. Applications in writing to—Box No. 3557, Electrical Times. (H 828)

ELECTRICAL ENGINEER, age not over 30, preferably with degree, required at factory in West Midlands, for testing and development work in connection with high voltage porcelain insulators. Applicants should have some industrial experience in connection with the manufacture or testing of high voltage equipment. The maximum salary for this post is £1,210 per annum, and the starting salary will be calculated according to the qualifications and experience of the successful applicant.—Box No. 3551, Electrical Times. (H 811)

ELECTRICAL ENGINEER, aged under 35, with some years' industrial experience and holding H.N.C. required for training as Assistant Corrosion Engineer by large Oil Company in Middle East. Substantial emoluments, pension fund, paid home leave. Bachelor preferred, as married man would have to be prepared for initial separation. Write quoting No. 434 to Box 7676, c/o Charles Barker and Sons Ltd., 31 Budge Row, London, E.C.4. (H 817)

ELECTRICAL ENGINEER required, age 30-35, with initiative and experience of the installation and maintenance of machines and distribution systems in large factories. Applicants should have served a recognised apprenticeship and be capable of negotiating contracts with equipment manufacturers. Salary in accordance with qualifications and experience. Profit Sharing Scheme. Pension Fund. Canteen facilities. Apply, with details of education and experience in chronological order, to: The Chief Engineer, The Associated Portland Cement Manufacturers Ltd., Portland House, Tothill St, London, S.W.1. (H 826)

LONDON Consulting Engineer requires ELECTRICAL ENGINEERING ASSISTANT aged 28-34 for design of installation work in factories, schools, office buildings, etc. Previous experience in Consultants or similar establishment an advantage. Superannuation Scheme. Write stating age, experience, qualifications and salary required to G. H. Buckle and Partners, 2 Harrington Gar, London, S.W.7. (H 827)

SIMPLEX ELECTRIC CO., LTD. require an experienced REPRESENTATIVE for the North West Midlands. Must be fully conversant with modern installation practice and able to develop the sale of the Company's products in this field. Preference will be given to an applicant who is a car owner and is resident in the Wolverhampton district. Applications stating age, qualifications and salary required should be made to the Secretary, Simplex Electric Co., Ltd., Oldbury, Birmingham. (H 830p)

MAINTENANCE ELECTRICIANS required for large Paper Mill. Sound experience of large A.C. and D.C. motors and switchgear essential. Bowater's Thames Paper Mills Limited, Northfleet, Gravesend, Kent. (H 855)

REPRESENTATIVE required by well established manufacturers of high grade switches to cover Northern Counties. Contact with Area Boards and leading industrial organisations an advantage and one of two other agencies in electrical line not objected to. Reply giving full details including experience and remuneration expected to—Box No. 3559, Electrical Times. (H 829)

OLD-ESTABLISHED Electrical Manufacturing Company require the following DRAUGHTSMEN:

Electrical Design Draughtsman for work on design of small mechanisms, experience of mechanical shockproof equipment an advantage.

Electrical Design Draughtsman with some experience of small mechanisms. Interesting development work.

5-day week, Superannuation Scheme, and Canteen facilities.

Apply giving full particulars of age, experience and salary required to—Box No. 3549, Electrical Times. (H 804)

SALES ENGINEERS having initiative and enthusiasm wanted. Well-known Company manufacturing motors, transformers, etc., has vacancies in Midlands for both Senior and Junior positions. Confidential.—Box No. 3553, Electrical Times. (H 812)

TRANSFORMER DESIGN ENGINEER required for work on power transformers, preferably with University Degree or H.N.C. in Electrical Engineering. Apply stating age, experience and salary required, to Denis Ferranti Co., Ltd., Rhos Mill, Royton, Oldham, Lancs. (H 803)

THE ENGLISH ELECTRIC CO., LTD., have vacancies at their Liverpool works for TRANSFORMER SALES and CONTRACTS ENGINEERS. Candidates should have H.N.C. in Electrical Engineering, and preference will be given to those with experience of this type of work. Reply stating age, experience and qualifications, to Dept. C.P.S., 336/7 Strand, W.C.2, quoting Ref. 898A. (H 728)

TECHNICAL SALES REP., with Industrial eng. exp. required for Midlands area, to deal with application of elec. instruments, relays and timing apparatus. Salary from £600 p.a. Contributory Pension Scheme. Applications in confidence, with details of education, training, exp., age and other qual. to Everett Edgcumbe and Co., Ltd., Colindale Works, Hendon, N.W.9. (H 693)

TRANSFORMERS Sales Engineers. Bruce Peebles and Co., Ltd., Edinburgh 5, have vacancies for experienced Senior Contract and Tender ENGINEERS in their Transformer Sales Department. If necessary, assistance will be given in housing. State experience, age and salary required to Sales Manager at the above address. (H 787)

WANTED. INSULATION ENGINEER with experience of electrical machines, etc., to work on varied development problems. Salary according to experience and qualifications. Apply Personnel Manager, Metropolitan-Vickers Electrical Co., Ltd., Trafford Park, Manchester 17. (H 788)

YOUNG ELECTRICAL DRAUGHTSMAN for engagement on wide variety of installation work. Should be fully competent to design and draft lighting and power schemes for all types of buildings and to supervise site works. Good salary in accordance with experience. Previous knowledge of professional work not essential. Write in confidence giving particulars of age and experience to A. J. P. Pashler, Consulting Engineers, 50 Newhall St, Birmingham 3. (H 856)

WANTED

WANTED, D.C. and A.C. ball-bearing MOTORS, motor generator sets, dynamos and alternators.—Full details to Britannia Manufacturing Co., Ltd., 22-26 Britannia Walk, London, N.1. (H 12)

WANTED. ROTARY CONVERTERS, any size.—Universal, 221 City Rd, London, E.C.1. (H 14)

WANTED, for prompt cash, ferrous and non-ferrous SCRAP; also plant for dismantling. Buyers of secondhand machinery and plant for re-use.—W. and H. Cooper Ltd., 176 Brady St, Bethnal Green, E.1. (H 10)

WANTED WASTE MERCURY 12s. 6d. lb or more delivered depending on quantity, also Electrical Contacts, magneto points, etc. Keenest prices for all non-ferrous and precious scrap metals in any form. Cash on collection by arrangement. Belgrave Buyers (E.T.), 5 Belgrave Gardens, London, N.W.8. MAI 7513. (H 791)

APPOINTMENTS WANTED

ELECTRICAL ENGINEER with Consulting Engineering experience seeks appointments. Inspections, Reports and recommendations, site supervision, etc. Fees reasonable.—Box No. 3563, Electrical Times. (H 849)

WORK WANTED

A.C. and D.C. MOTOR REWINDS and REPAIRS. Prompt service fully guaranteed. Edgware 5566 (4 lines).—Service Electric Co., Ltd., Stanmore, Middx. (H 20)

ARMATURE REWINDING service to the trade. Vacuums, Drills, Grinders, Hood Dryers, Dental Motors. Vacuum cleaner and drill armatures replaced from stock 24-hour service. Every job guaranteed. All vacuum cleaner parts, hoses, etc., in stock for any make. Apex washer agitator shafts stocked.—Regam Electric Cleaner Service, 95 Park Lane, Leeds 1. (H 25)

FISHER FOUNDRIES LTD., Greet, Birmingham 11, for Machine Moulded Precision Castings in gun metal and soft grey iron. Tel.: Victoria 0197. (H 53)

WORK WANTED. Capacity available for all types of COIL WINDING.—Box No. 2425, Electrical Times. (H 23)

BUSINESSES FOR SALE

SMALL Electrical Contracting Business with Freehold Living Accommodation, S.E. Essex.—Box No. 3533, Electrical Times. (H 722)

FOR SALE

BRITISH ELECTRICITY AUTHORITY
North West, Merseyside and N. Wales Division

INVITES Tenders for the purchase and removal of redundant plant comprising large transformers, stoker-fired boilers, motorised pumps, rotory convertors, metal cubicles with O.C.B.'s, D.C. control panels and subsidiary equipment, 19 ft 9 in. by 6 ft 6 in. diameter oil tank, situated at various generating stations in Lancashire and Cheshire.

General conditions and Form of Tender may be obtained from Divisional Secretary, 825 Wilmslow Rd, Manchester 20. Completed tenders to be returned not later than 14 June, 1954. (H 807)

BRITISH ELECTRICITY AUTHORITY
London Division
SURPLUS PLANT

OFFERS are invited for the purchase and removal of the following plant from Taylor's Lane Generating Station, Willesden, London, N.W.10.

3 Reyrolle Ironclad Oil Circuit Breakers, Type C.I.X.7B, Art No. 31A127X, 11,000 V, 600 amps, 50 c/s, with C.T. Chambers, busbars and standards, C.T. Ratios 200/5.

For permission to view and Conditions of Tender, application should be made to the Divisional Purchasing Officer, British Electricity Authority, London Division, Generating House, Great Portland St, W.1, not later than 14 June, 1954. (H 805)

150 "INCONEL" SHEATHED TORRIBAR HEATING ELEMENTS, 9 ft 8 in. long, 0·315 in. overall diameter, 380 W, 220 V, D.C. Each end insulated with mica washers and supplied with flexible monel leads 2 ft long. Condition—unused. Enquiries to—Box No. 3561, Electrical Times. (H 831)

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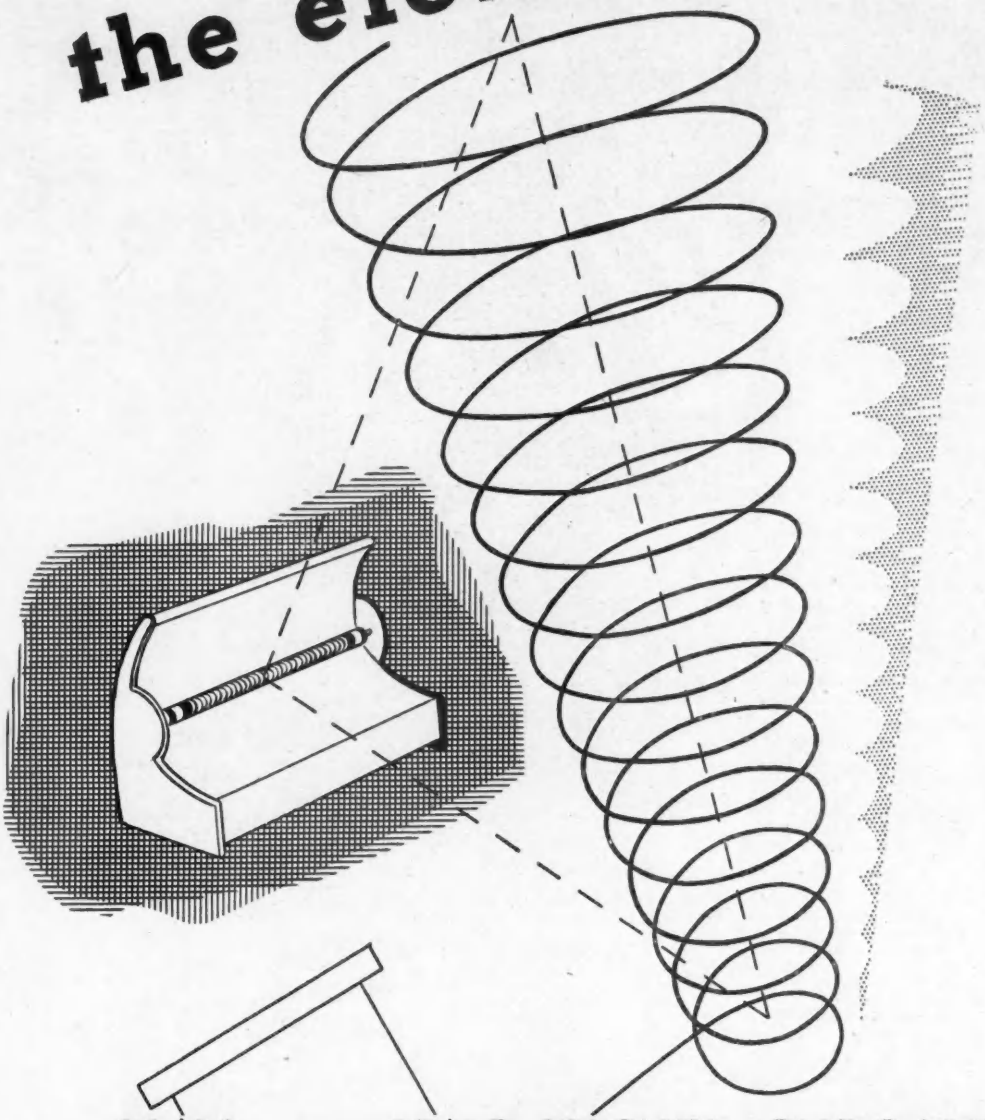
the element



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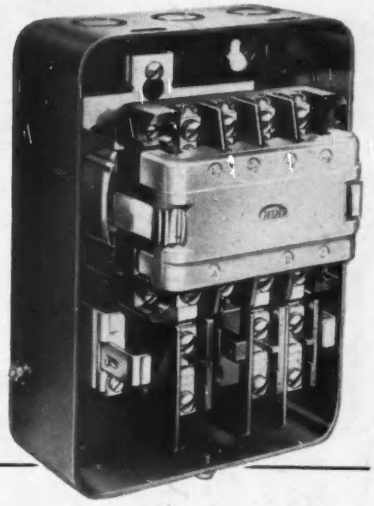

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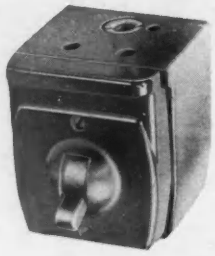

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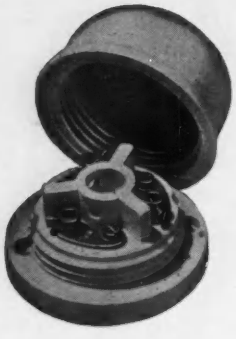

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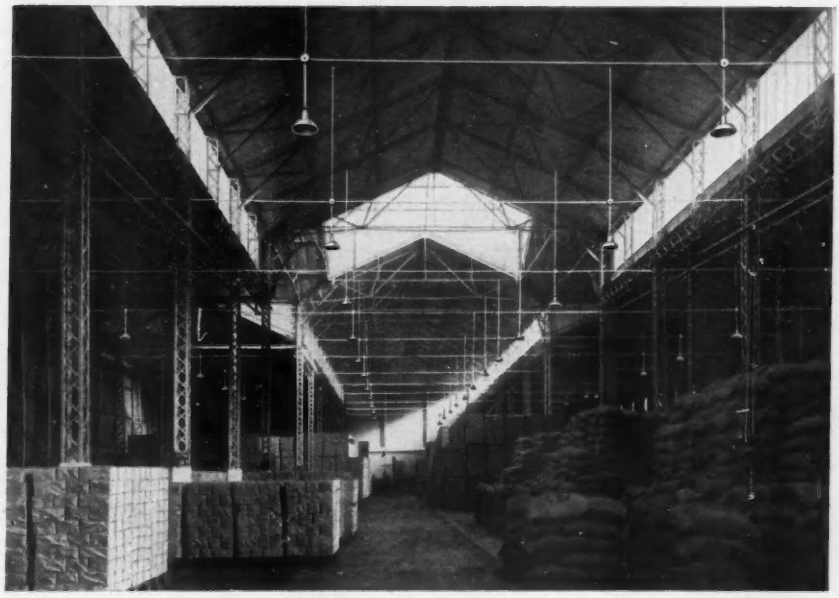

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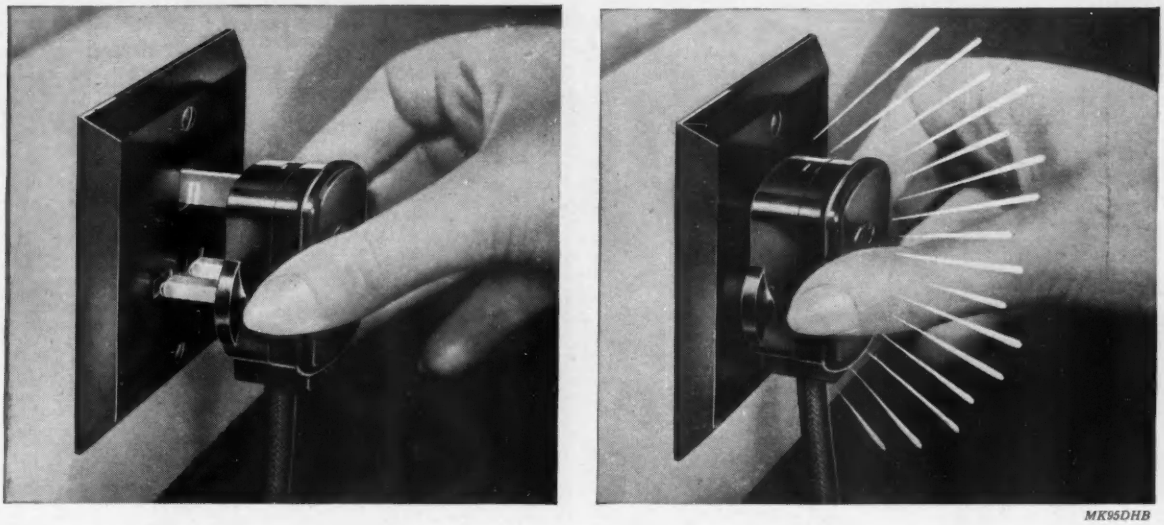

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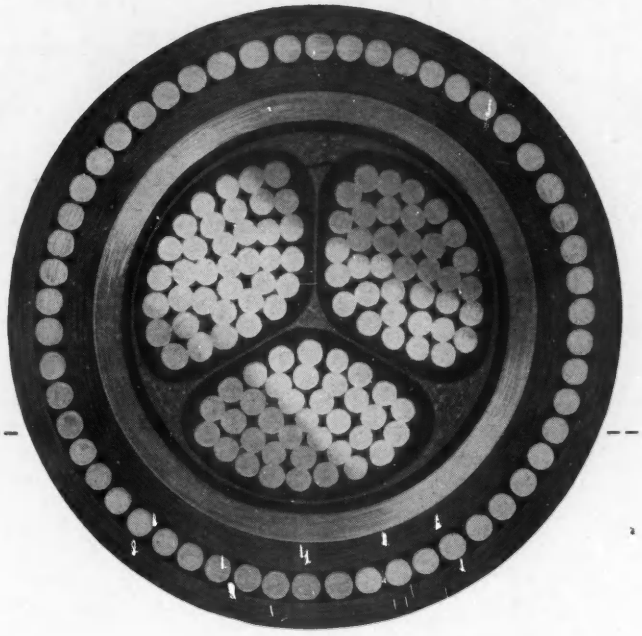

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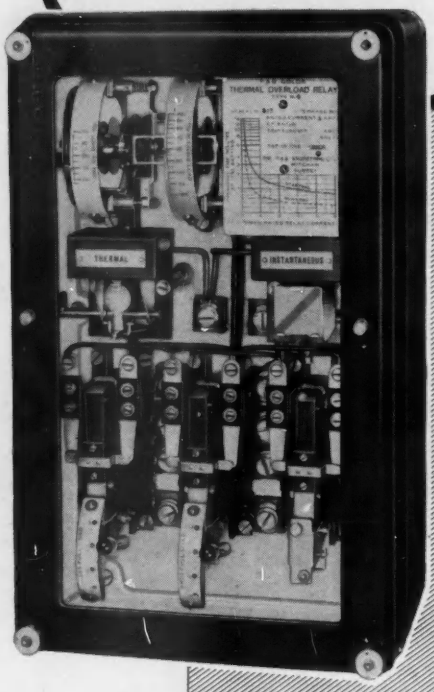

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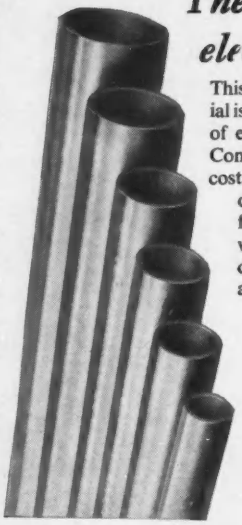

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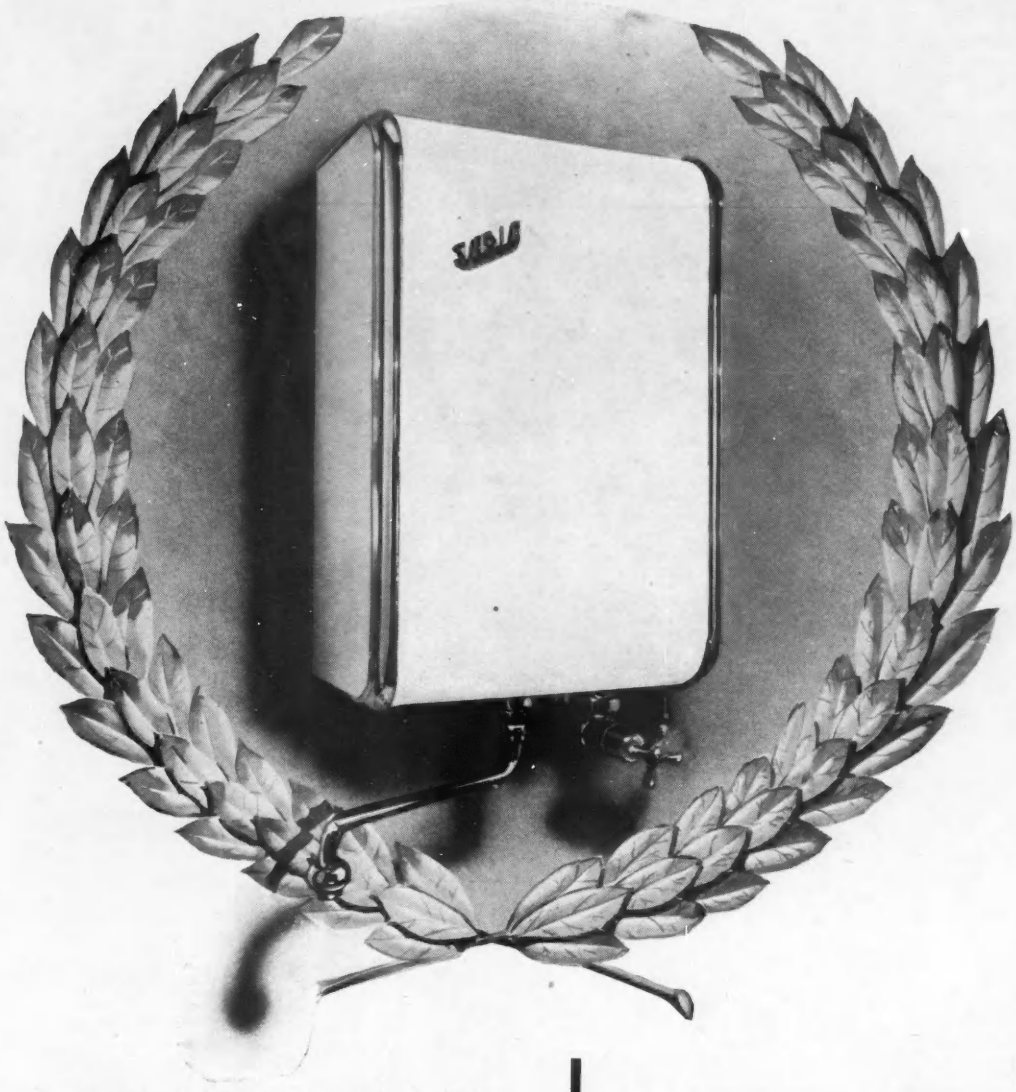

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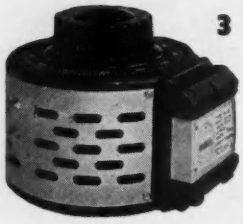

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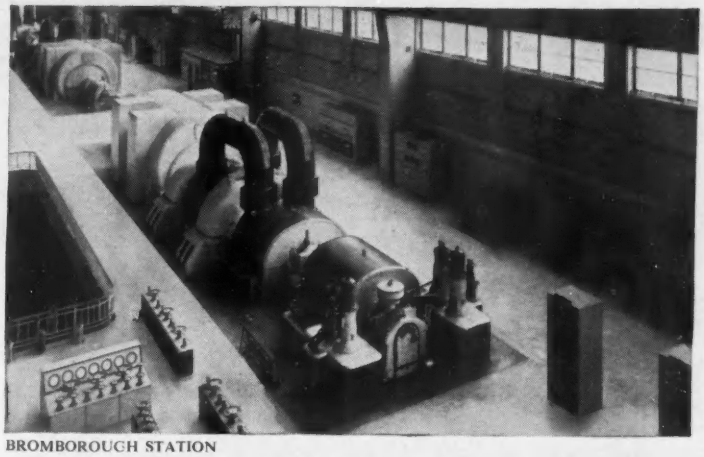

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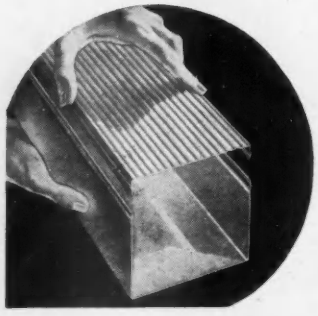

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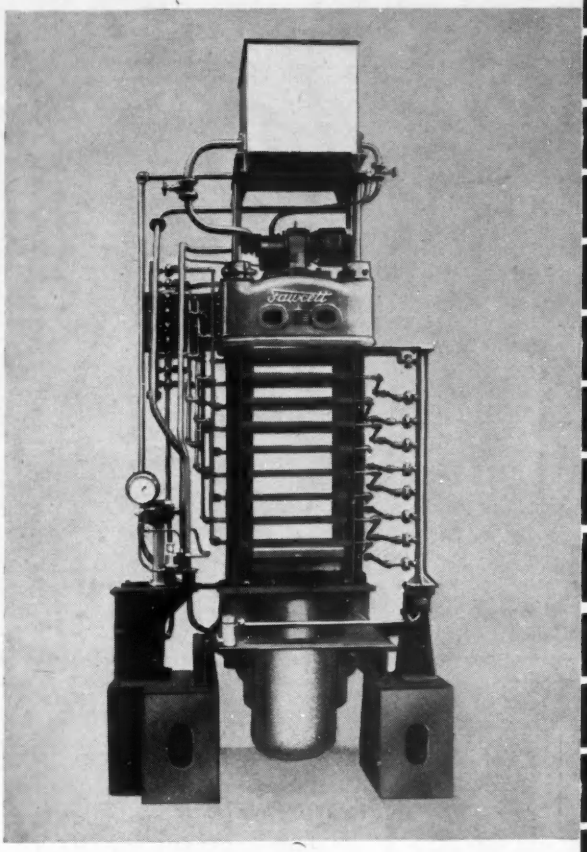
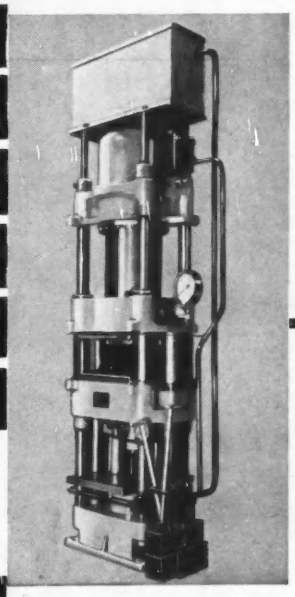


This 500-ton up-stroking multi-platen Press has a self-contained pump and oil reservoir mounted on top. Platens are arranged for alternate steam heating and water cooling.



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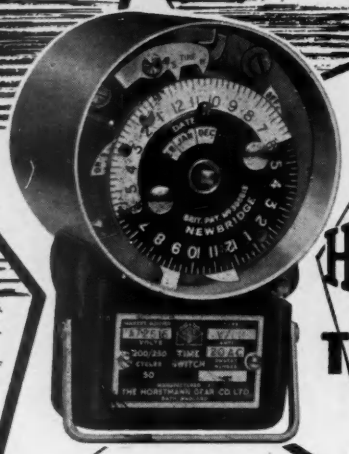

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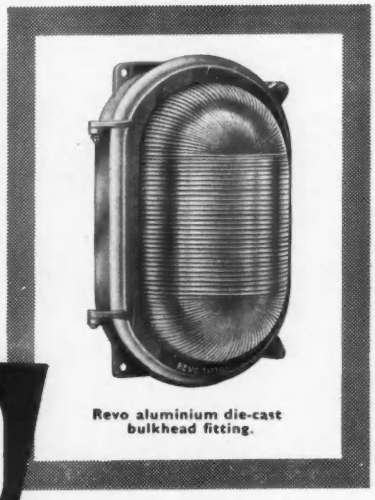

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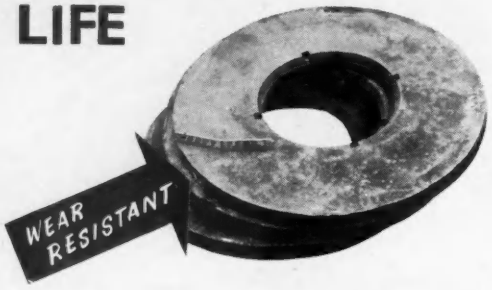

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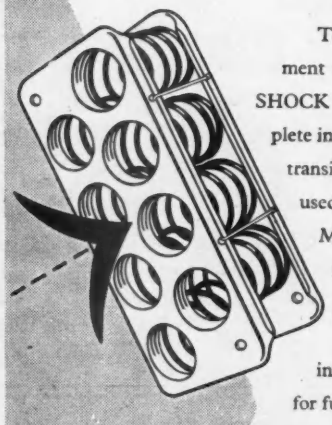

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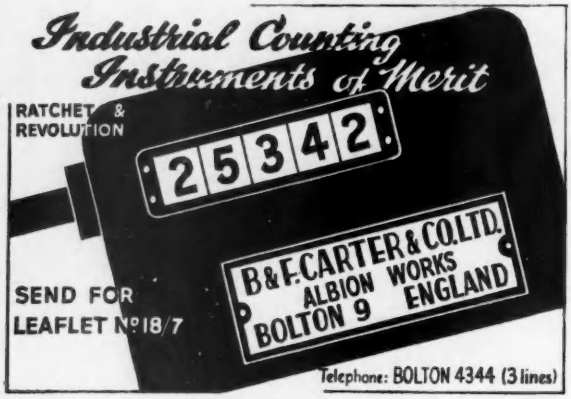

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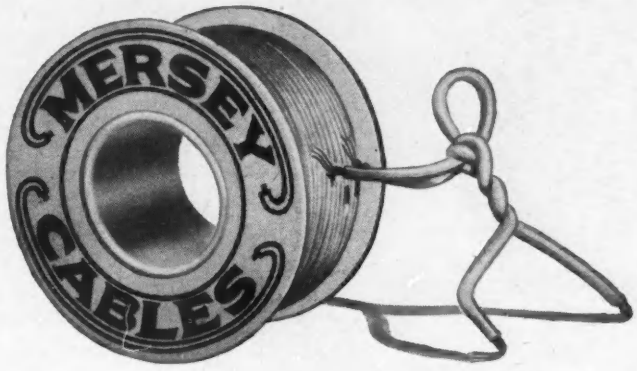

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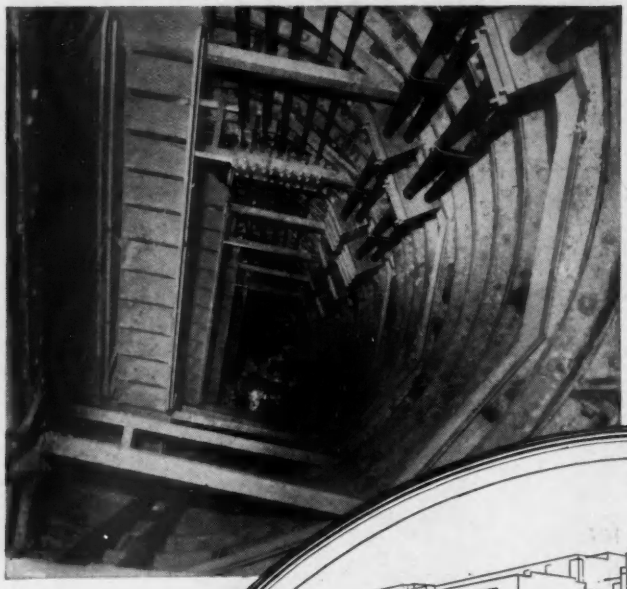
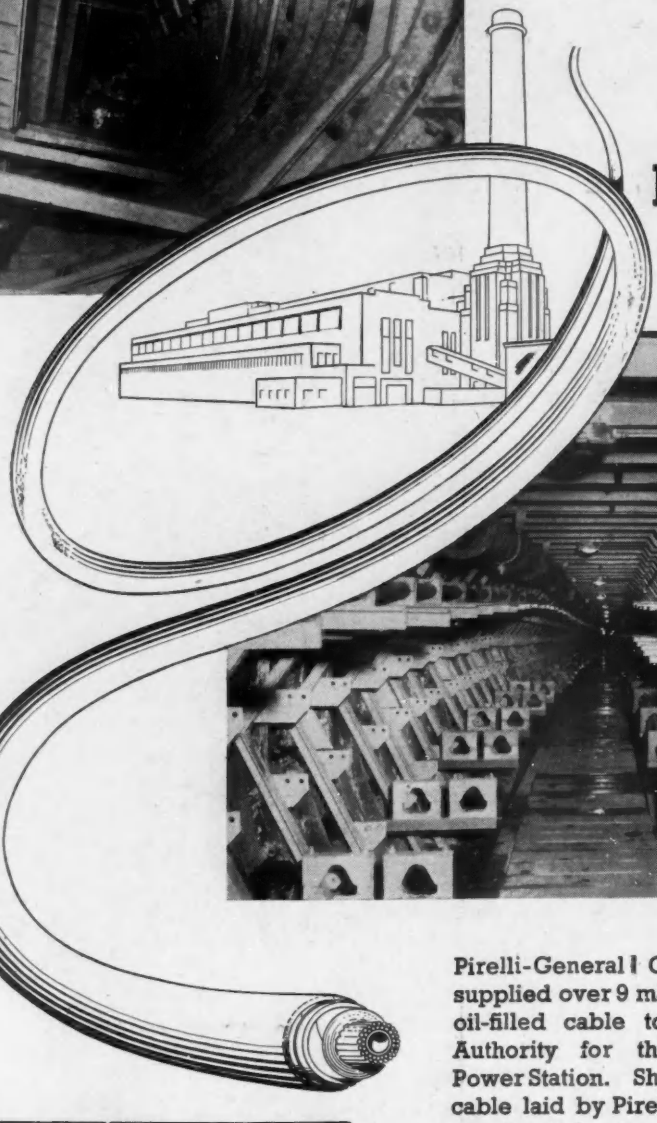
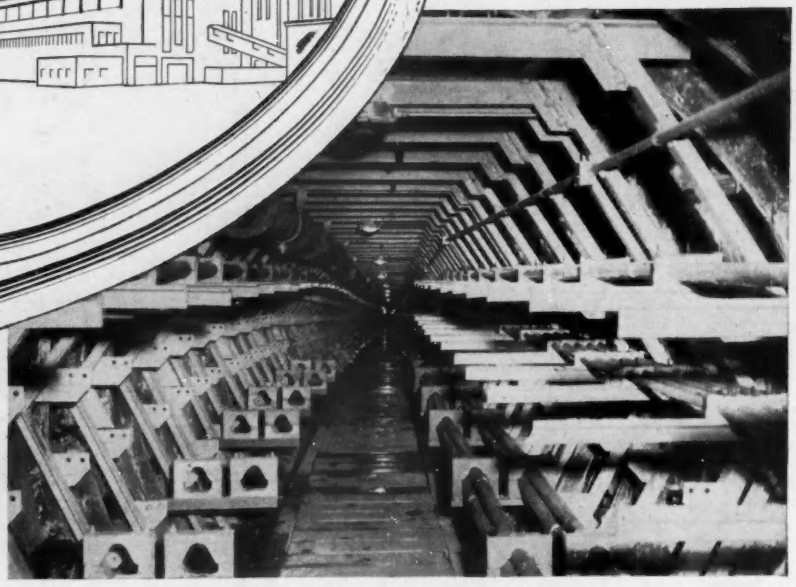


Nine miles

of 132 kV. OIL-FILLED CABLE for BRIGHTON "B"





Pirelli-General Cable Works Ltd. has supplied over 9 miles of single core 132 kV. oil-filled cable to the British Electricity Authority for the new Brighton "B" Power Station. Shown here is some of the cable laid by Pirelli-General in a specially constructed tunnel under Shoreham Harbour, which connects two of the generator transformers to the Southern Cross Switching Station.

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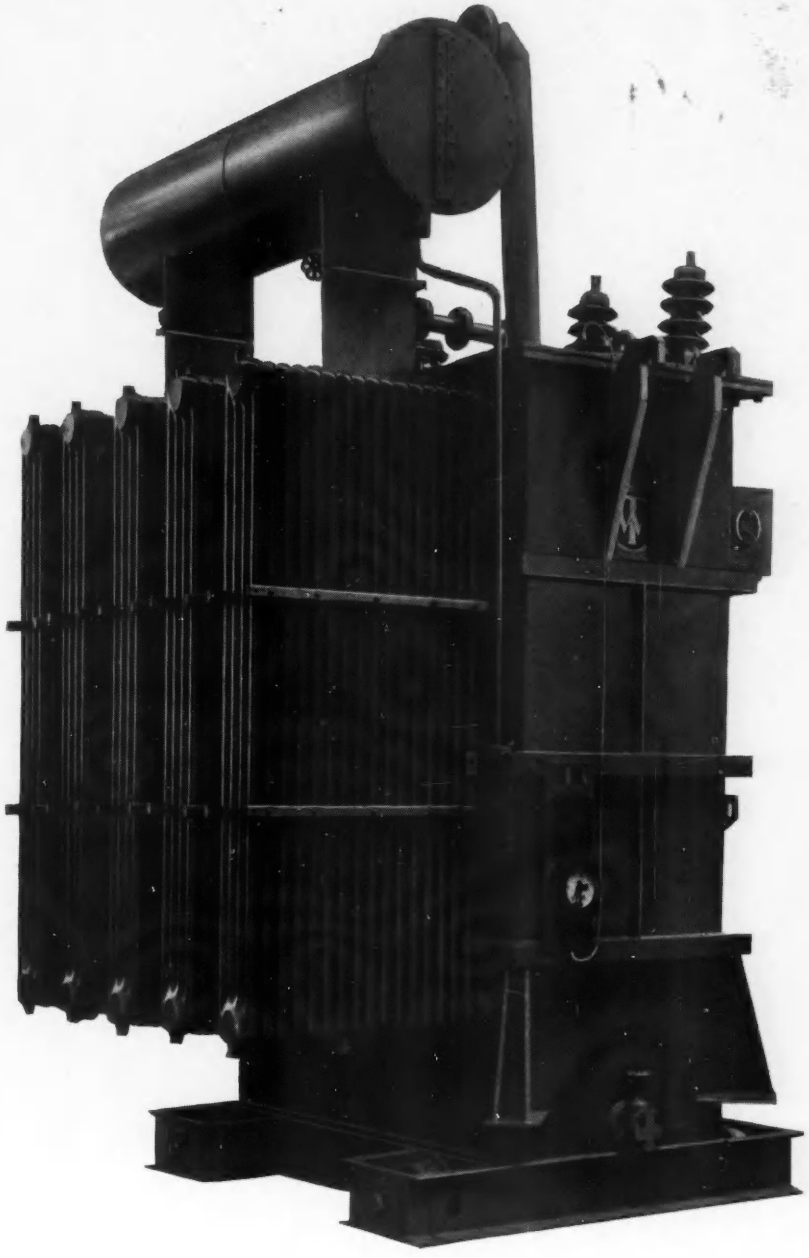

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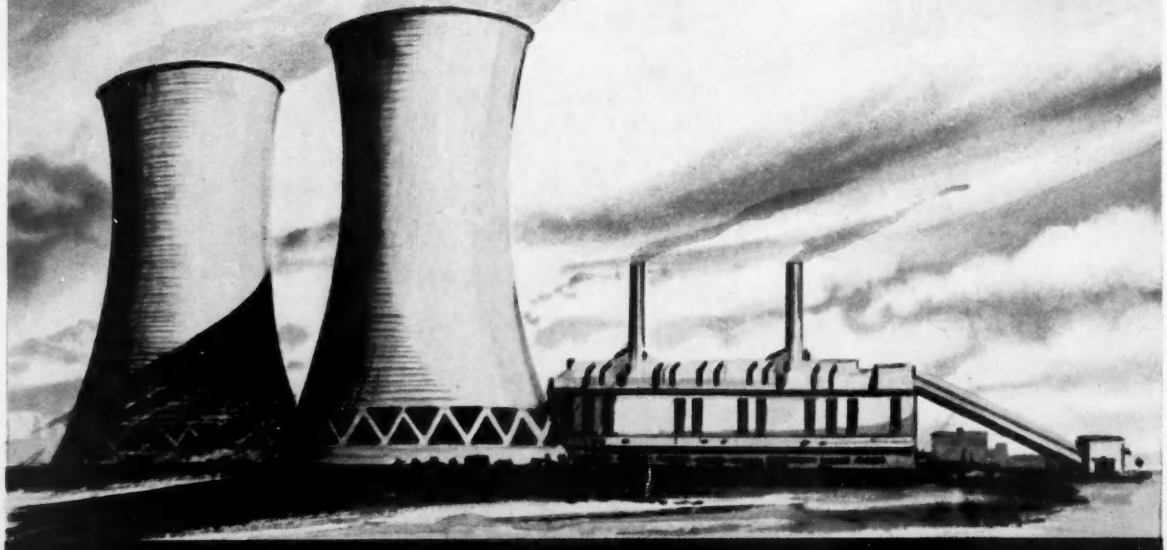

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